VOLUME VII MAY, 1914 NO. 5

Southern Medical Journal

Journal of The Southern Medical Association

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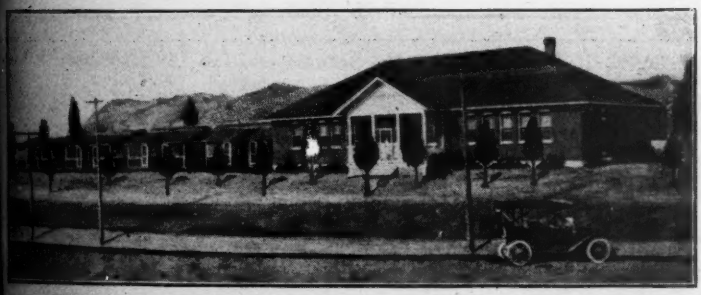

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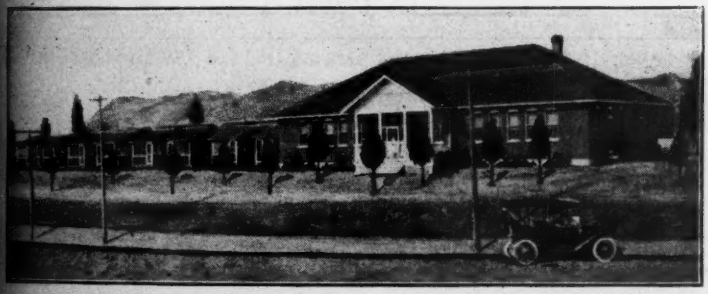

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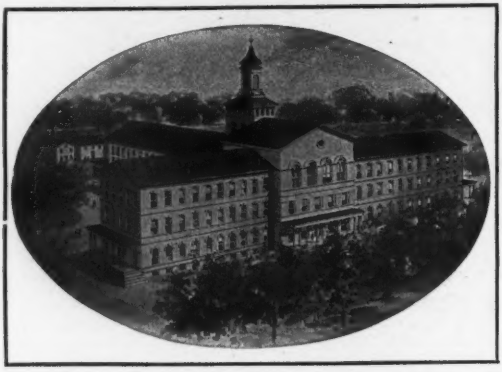

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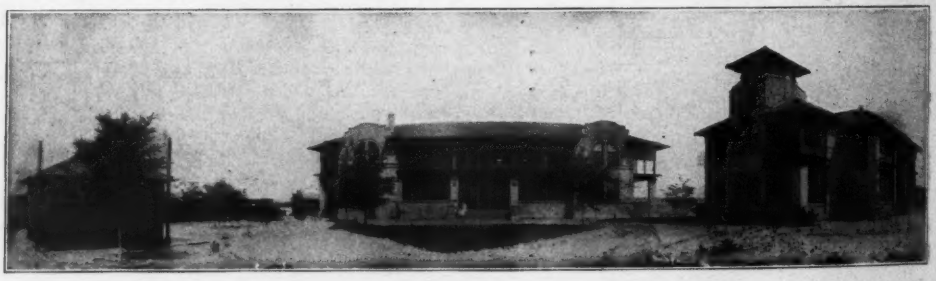

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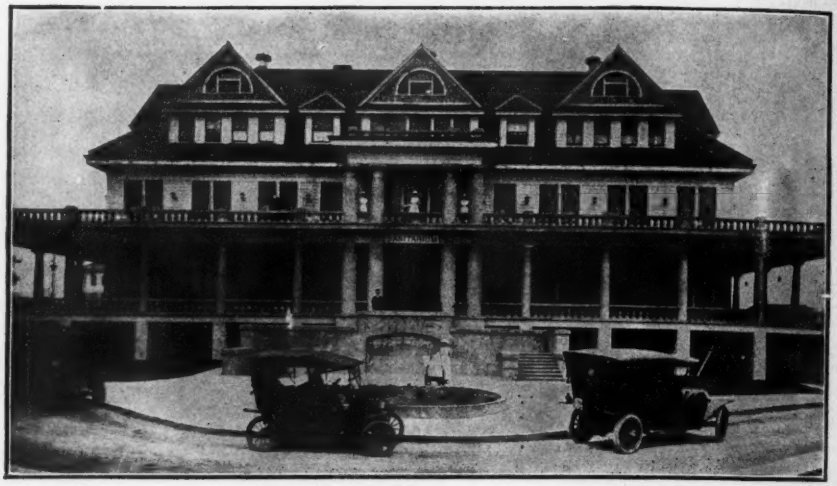

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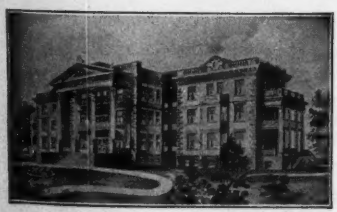

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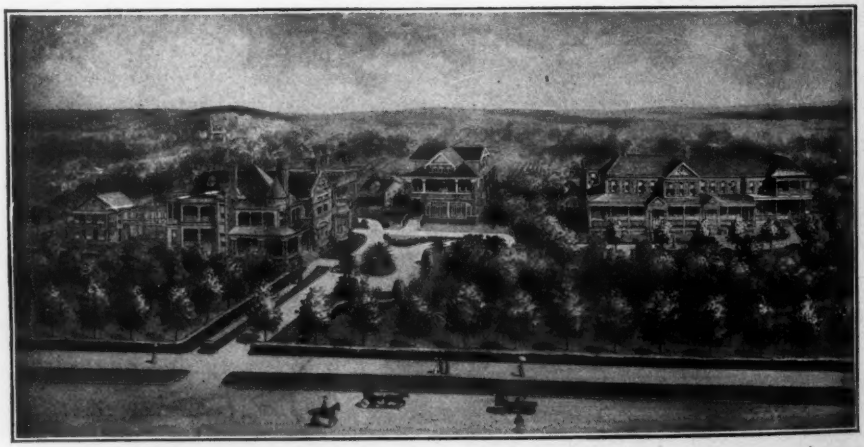

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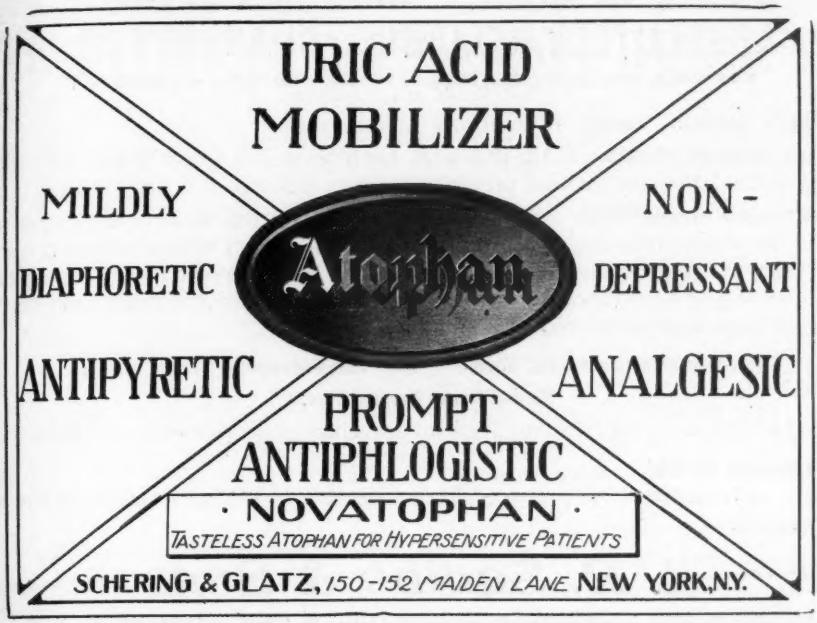

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SOUTHERN MEDICAL JOURNAL

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ORIGINAL ARTICLES

INVESTIGATION OF MALARIA IN THE UNITED STATES BY THE UNITED STATES PUBLIC HEALTH SERVICE.*

By R. H. Von Ezdorf, M.D.,
Surgeon U. S. Public Health Service, Mobile, Ala.

A great deal has been written on the subject of malaria in the United States, and yet there is lacking a summary study of the prevalence and geographic distribution of the disease.

This work was undertaken by the United States Public Health Service, and on February 28, 1912, I was detailed by the Surgeon-General of the United States Public Health Service to make a study of the disease in the state of Alabama. On July 8, 1913, the work was extended to include the states of Arkansas, Mississippi, South Carolina, Georgia and Florida, and later North Carolina and Tennessee.

The studies thus far made have been conducted on the following general lines:

STATISTICAL.

Circular postal cards with reply cards, numbering about 12,000, have been sent out each month, addressed to physicians in the states of Alabama, Arkansas, Florida, Georgia, Mississippi and South Carolina. The replies received are filed according to states and counties, and when the reports have been tabulated they will form a part of a report for each state. It is hoped that preliminary reports will be at hand by early spring.

These reports will give the number of physicians, number of towns, cities or places represented, number of cases, by color, of malaria treated, types of infection, types confirmed microscopically, number of physicians using microscope, number of cases occurring in children under fifteen years of age, number of chronic cases, presence of mosquitoes and species, and the prophylactic measures in use for each county in each of the states under investigation.

DETERMINATION OF TYPES OF INFECTION.

Since an extension of the work was determined upon, it was planned to obtain from physicians in every county in the state of Alabama specimens of blood from active and chronic cases of malaria, for microscopic examination, in order to confirm the types of malaria prevailing.

A number of physicians in Alabama promised to co-operate and submit such specimens. However, in order that this part of the work may be more satisfactorily accomplished, it has been decided to study a limited number of counties at a time for an entire season in order to also determine the seasonal prevalence of the types.

DISTRIBUTION OF ANOPHELES MOSQUITOES.

The co-operation of physicians was sought and requests were made for specimens of mosquitoes prevailing in their particular localities. Vials for mosquitoes, and mailing cases, with franks for return, were furnished to physicians in every county in the state of Alabama,

*Read in Section on Medicine of the Southern Medical Association, Seventh Annual Meeting, Lexington, Ky., Nov. 17-20, 1913.

who responded favorably to a circular letter sent out requesting such specimens.

SURVEYS AND MALARIAL INDEX.

In selected localities in Arkansas, Alabama and North Carolina surveys were made to determine the conditions contributing to the prevalence and spread of malarial fevers.

The geographic and climatic conditions of the locality, social, hygienic and economic conditions of the community, location of breeding places of anopheles and the methods applicable for control were all studied.

Specimens of blood for microscopic examination were obtained from a number of persons in such places in order to determine the malarial index. In this connection it was found impracticable to make a splenic index.

In Arkansas 802 persons from five places were examined. I have just left North Carolina, where I obtained blood specimens from 3,264 persons from seven places, which represents approximately 7 per cent of the population of the communities visited.

There were two preparations made from each person under examination, one thin and one thick film. A history was also obtained from each person, giving name, age, sex, color, residence, previous history of malaria and remarks whether enlarged spleen is present, quinine taken, etc., and date.

These preparations will be examined at the laboratory established in Mobile, Ala.

EDUCATIONAL.

Under the auspices of the State Board of Health, arrangements are made for delivering public lectures and lectures at schools on the subject of malaria and its prevention. Lantern slides are sometimes used. In each place also larvae and pupae of different species of mosquitoes were collected and shown and the points of differentiation demonstrated.

In several places in North Carolina classes of school children, usually those from the high schools, were taken out on a search for mosquito breeding places. These pupils quickly learned to identify the anopheles larvae from others.

COMMUNITY ANTI-MALARIAL WORK AND THE STATE BOARD OF HEALTH.

The studies being made will be brought to public attention in order to stimulate and arouse greater public interest, and, in that way, a public demand for instituting anti-malarial work.

Large industries, employing a large number of persons, are awaking and are beginning to realize the economic value of maintaining a healthy force. In some places visited it was found that industrial concerns are adopting measures for the prevention of the spread of malaria and are thus demonstrating that the disease is easily controlled.

It is hoped that in each state some communities will be induced to take up anti-malarial work which will serve as demonstrations.

The United States Public Health Service would only undertake such work in co-operation with the State Boards of Health.

On the part of the United States Public Health Service surveys of localities will be undertaken to ascertain:

The malarial index.

The breeding places of anopheles.

The species of anopheles present.

The most practical measures to be immediately adopted for control.

Educational work, by means of lectures, lantern slide demonstrations, etc.

PERSONNEL.

An office has been established at Mobile, Ala.

There are at present six officers of the Service engaged in this work, namely:

Surgeon J. H. White, with one assistant surgeon, for the state of Louisiana; Senior Surgeon H. R. Carter, stationed at Baltimore, and the force with headquarters at Mobile, Ala., working under my direction.

MALARIA AS A PUBLIC HEALTH PROBLEM.*

By H. H. SHOULDERS, M.D.,
Assistant Secretary Tennessee State Board of Health, and State Registrar of Vital Statistics,
Nashville, Tenn.

Malaria, as a public health problem, is of late justly receiving some long needed attention. We have known for some time the essential facts connected with its causation, transmission and prevention, but the South, it seems, has been slow to adopt measures toward its prevention. This slight awakening has probably come about as a result of the wonderful demonstration by Col. Gorgas in the Canal Zone, that the disease can really be handled, and probably further by the fact that we, in the South, are just beginning to experience a consciousness of our own importance, which is causing us to look about and attempt to correct errors—such as exist.

Last year the commission appointed by this association for the purpose of investigating malaria and its prevention made a report, which contains much valuable data. One very striking fact developed by the investigation was to the effect that measures seeking to prevent malaria had been adopted in only 46 per cent of the counties reporting, and these reports were from a malarial section. We were not advised as to the methods adopted by this 46 per cent of counties, nor as to how diligently they were prosecuted, but we would not presume that they were very thorough.

It has been demonstrated over again that money and energy, properly expended in the prevention of malaria, offer as great a reward as that expended in the prevention of any disease. It has further been demonstrated that no method, however crude, will be entirely without results.

In order that malaria may be intercepted at different points in its route of transmission, various principles may be followed up, each of which, if thoroughly done, would accomplish the eradication of the disease. These principles may be classified as follows:

1. The principle of preventing the access of infected mosquitoes to well persons—individual protection.
2. The principle of mosquito destruction.
3. The principle of preventing infected persons from infecting mosquitoes. Immunization by quinine might be mentioned, but it is really killing the infection as it enters.

In following up the principles of preventing infected mosquitoes from infecting a healthy person, the following measures may be adopted:

Screening with 18 to 20-mesh screens; the mosquito net; sleeping in an up-stairs room, and the periodical dose of quinine. These measures have been described and emphasized in all our text-books, and need no elucidation by me, other than to say that they should constitute a part of any campaign against malaria.

In following up the principle of mosquito destruction, the destruction of their breeding places, of course, takes first place. It is probably true that most laymen, and a considerable number of physicians, have an exaggerated idea of the extent of work necessary to accomplish great good.

Dr. Ross, in giving a summary of objects sought in a campaign of malaria eradication, stated, "We do not purpose to exterminate mosquitoes in any continent. We do not purpose to get rid of every mosquito even in this town. We aim only at reducing the number of the insects as much as possible. We do not think it possible to drain or otherwise treat every breeding place in the town. We aim at dealing with as many as possible."

One feature of the work done by Col. Gorgas in the Canal Zone deserves special mention in this connection, and that is he did not attempt to destroy the breeding places of

*Read in Section on Medicine of Southern Medical Association, Seventh Annual Meeting, Lexington, Ky., Nov. 17-20, 1913.

the mosquito for a distance of over two hundred yards from camp, and, in spite of this fact, he regards it as one of the most potent measures adopted by him. This teaches us the lesson, if it be true, that in attempting this method of mosquito destruction we need not extend our efforts for such a great distance from a town or residence; at the same time, the importance of thoroughness in the area covered is to be emphasized. In other words, an oyster cup in the back yard, or a gutter which allows a small collection of water, is of far greater importance than a pond, lake or river a few hundred yards away.

Deaderick makes the observation that a large collection of water is not near so favorable a breeding place for the mosquito as is a small stagnant pool, or a small marsh surrounded by weeds which affords a shelter for the pests.

These few facts and opinions are apparently trivial, but are really of great importance. Their simplicity, and the fact that they will bring results, will commend them to the lay mind, and stimulate efforts which would never be put forth while laboring under the impression that work of this character must be of great magnitude before it will accomplish its purpose.

The next attack on the living mosquito is by fumigation in the home when they have gained access.

The third principle to be followed up is that of preventing the mosquito from becoming infected. This may be accomplished (a) by screening the person who harbors the parasite in a form which is capable of undergoing sexual development in the body of the mosquito, and (b) by destroying the parasite in the human host.

The malaria plasmodium in the blood of man occurs in both the asexual (schizont) and the sexual (gamete) forms, and as the sexual, or gamete, is the one capable of taking on sexual activities in the body of the mosquito, it is the form to be considered in this connection. The consensus of opinion seems to be that these forms are not developed in the blood during the first few days of an acute attack of malaria—not until about the fourteenth day. If this be true, screening an acute case would be unwarranted. However, the fact that the case may be a recurrence, or a relapse, in which instance the gamete forms may be present early, render the screen essential until proper treatment has been carried out for a sufficient length of time, or until it can be determined that the gametes are not present. Of course, the screening of a chronic malaria carrier would be utterly impracticable at present.

THE DESTRUCTION OF THE PLASMODIA IN THE HUMAN HOST.

The asexual form of the plasmodium is very susceptible to the action of quinine. The sexual, or gamete, form is very resistant to the action of quinine. Bass makes this statement: "Though quinine will probably not kill the sexual malarial plasmodia, it will kill the young plasmodia which they produce, resulting in relapse." In other words, quinine is capable of destroying the forms of the plasmodia which are developed from gametes.

These scientific facts usher in the possibility of eradicating malaria by the destruction of the parasite in the body of man.

In that gametes are not formed until about the fourteenth day, and in that quinine is capable of destroying the earlier forms in a far shorter period of time (in from 36 to 72 hours) the early and proper administration of quinine in the initial attack would surely serve to prevent the formation of gametes, or cure the case before gametes are formed. If quinine is improperly administered, or not administered at all in the initial attack, gametes will form, and the case becomes a carrier of the disease, and presents a problem to be dealt with that is far more complex from a public health standpoint.

The gamete, or sexual, form succumbs to old age in about six weeks, but the forms capable of developing gametes are susceptible to the action of quinine and, therefore, the

administration of quinine for this period of time would serve to destroy the asexual forms, and allow the existing gametes to die of old age—thus transforming a very dangerous carrier of a dangerous malady into a harmless and healthy person. Gametes, then, can be prevented from developing by early and proper treatment of the initial attack of malaria, and gametes can be destroyed by the proper administration of quinine for a period of time.

Craig states, "The practice of regarding malarial infection as cured because the active symptoms of the disease have disappeared is a most common and a most pernicious one," and that is responsible for a large proportion of our cases.

Henson regards recurring malaria as *prima facie* evidence that the disease was improperly treated at first. He advances the opinion further that gametes are allowed to form in a large majority of cases as now treated by the general practitioner, which means that a large majority of our cases of malaria are allowed to become carriers, whose blood is teeming with gamete forms of the plasmodium ready to be taken into the body of the mosquito, and transmitted to healthy persons.

A point of great importance has been brought out by Dr. Thayer, which is that if a mosquito is exposed for any length of time to a temperature below 65° F. plasmodia fail to develop in her, and those that have developed die.

Bass, in elucidating this point, shows that the mosquito could not serve as the host of the plasmodia for more than six to eight months in the year except in the extreme southern portion of the United States. During the remaining four to six months the plasmodia must reside in the blood of man. In that the plasmodia can be destroyed in the blood stream in less time than this, it introduces the idea of eradicating malaria during the winter season by administering quinine as recommended by Bass: A proper amount of quinine on each of two consecutive days in each of six consecutive weeks during the cool season.

To accomplish any degree of mosquito destruction would require the hearty co-operation of the laity, re-enforced by legislation, and a considerable outlay of money, while the eradication of malaria by the destruction of the plasmodia within the human host could be accomplished by the profession of medicine almost single-handed; at least, it would merely require the co-operation of physician and patient. The bringing of the South into her very own is dependent to a great extent upon the eradication of this great scourge.

The possession of so far-reaching a power for good as that which the profession of medicine is capable of exerting in the eradication of this disease can be boasted of by no other profession. No more sacred duty, if it be a duty, is theirs to perform. Is the profession of medicine equal to this task? Are we willing, to a man, to deliver with philanthropic hand this boon to our Southland?

I am not so much of a dreamer as to presume that the eradication of malaria will be accomplished in the next short while, but I do believe that when the profession of the South has become fully conscious of its possibilities, and when the laity shall have been made to understand the simple fundamentals of malaria prevention, rapid strides will be made towards accomplishing the goal of its eradication.

TREATMENT AND CURE OF MALARIA.

By C. C. Bass, M.D.,
New Orleans, La.

There is perhaps no disease known to man for which we have as perfect a specific as we have for malaria. This specific, quinine, is only a specific, however, when properly ad-

*Read in Section on Medicine of the Southern Medical Association, Seventh Annual Meeting, Lexington, Ky., Nov. 17-20, 1913.

ministered. This is true of each of the small number of specifics we have in medicine. For instance santonin is a perfect specific for round worm infection, but if administered in insufficient quantity or on a full alimentary canal it has little or no effect on the infection. The same thing may be said of thymol in hookworm disease or male fern in tapeworm infection. Mercury and salvarsan are specifics for syphilis when properly administered, but otherwise they always fail. Diphtheria antitoxin is a most powerful specific for diphtheria, but when it is administered in insufficient doses and with improper intervals between doses little may be accomplished by it. In this paper it is intended to discuss the manner in which quinine should be administered for malaria and to relate some of the fundamental facts and principles which direct it and which often prevent success when quinine is improperly administered. Quinine is destructive to the asexual cycle of malarial plasmodia, but neither quinine nor any other known drug is known to have the slightest destructive effect on the sexual form of the parasite. Since the asexual cycle is responsible for most of the symptoms of the disease it may be well that we discuss first the destruction of the asexual parasites. Quinine cannot be expected to destroy any parasites except those with which it is brought into contact, and, therefore, those in the circulating blood. The asexual parasites of the different species of plasmodia vary widely in the length of time spent in the circulating blood and the length of time spent in the capillaries. In the instance of estivo-autumnal plasmodia not more than one-fourth of their life is spent in the flowing blood. During the remaining three-fourths of their life cycle they are lodged in capillaries. Tertian and quartan parasites pass at least two-thirds of their cycle in the flowing blood and less than one-third in the capillaries.

The amount of quinine necessary to kill all asexual plasmodia in the circulating blood does not exceed in any case thirty grains during each twenty-four hours. In fact, tertian plasmodia are nearly always killed by twenty grains per day and sometimes they may be killed by a much smaller quantity. Since thirty grains per day is not intolerable to most any adult, and since it is certain to produce results in all cases, this amount should be administered in all except perhaps very exceptional cases. This amount of quinine daily will destroy all asexual parasites in the blood during the given day, but it does not reach the parasites lodged in the capillaries. They do not remain lodged in the capillaries longer than forty-eight hours. Therefore, if thirty grains of quinine are given during each of two full days it is likely that all asexual parasites will be killed. It is probably better to continue the quinine for one more day in order to catch any parasites that, by chance, may have escaped. We can make a dogmatic statement that all asexual plasmodia of any species will be killed by thirty grains of quinine daily for three days. The proper subsequent management is based on certain fundamental facts relating to the sexual cycle of the plasmodia and on the susceptibility of man to develop tolerance for alkaloids and other toxins. It is quite customary, after the active acute symptoms have disappeared, following proper quinine treatment, to advise the patient to take a few grains of quinine daily either alone or in combination with various tonic drugs. Is this proper?

Let us consider what influences lead to the development of the sexual parasites. It is a fundamental law of nature applying to all animal life that reproduces both asexually and sexually, that as long as the most favorable conditions for the life of the organism exist they reproduce asexually; but that whenever unfavorable conditions appear they develop the more resistant sexual form and reproduce sexually. These sexual forms are developed, however, only whenever the unfavorable influence is insufficient to be destructive. For

instance, if we take a patient suffering with estivo-autumnal malaria, whose blood contains only asexual parasites and give him a small amount of quinine (2 to 5 grains) daily, after a few days large numbers of crescents and ovoids, sexual forms, appear in his blood and actually increase in number for some time. If, on the other hand, thirty grains of quinine are given to the patient daily for three days no sexual parasites develop. In the latter instance the quinine was sufficient to destroy the parasites while in the former the smaller amount only threatened the existence of the species which promptly proceeded to protect itself by developing the more resistant sexual form. This is sufficient to illustrate the small doses of quinine should not be given in malaria. Large doses are always indicated.

Most cases of malaria have in their blood more or less sexual plasmodia, and since the three days' quinine treatment does not destroy them they remain to be reckoned with. If they are drawn by certain species of anopheles mosquitoes they reproduce in from seven to fifteen days, depending upon the temperature at which the mosquito lives. If at human body temperature reproduction occurs in seven days. There is some kind of reproduction of sexual parasites in the body of man (not now well understood) which takes place in seven and multiples of seven days. This gives rise to the relapses that occur on the seventh, fourteenth, twenty-first and sometimes twenty-eighth days. These sexual parasites must either reproduce or die of age. It has not been definitely determined how long they may live without reproducing, but it is probably between two and four weeks. Though neither quinine nor any other drug will kill the sexual parasites, proper amount of quinine will kill their products of reproduction. All that is necessary, therefore, to entirely sterilize the blood of a patient is to give him thirty grains of quinine on every seventh day for four weeks or longer. Perhaps it would be better to give it for six weeks in order to certainly catch any parasites that may have accidentally escaped.

Additional harm results from continued administration of quinine because of the tolerance for the drug which patients readily acquire for this or other alkaloids or organic toxins.

A man takes one-fourth grain of morphine and is narcotized by it, but if he continues its use daily it soon requires many times this dose to produce the same effect. Such a condition could not result unless his body had acquired the ability of destroying or neutralizing the effect of morphine in some manner. A cigarette smoker accustomed to frequent doses of nicotine is little affected by it, but let him discontinue all smoking for a week or two and then smoke and inhale the smoke from another cigarette. He usually becomes dizzy and is profoundly affected; almost as much as one who had never smoked would be. Likewise, if one takes quinine continuously he rapidly acquires tolerance for the drug, and even large doses have not the effect that smaller doses would otherwise have. If, on the other hand, an interval of a few days is allowed to intervene between quinine treatment the full effect of the drug will be secured. Dogmatically we may say that every case of malaria (except moribund cases) will be cured and his blood sterilized of plasmodia by thirty grains of quinine daily for three days, followed by thirty grains on the same day of the week on which the last of the three days fell, for a period of six weeks. There should be no exceptions.

It is a matter of choice as to the number of doses into which the daily thirty grains will be divided. It is highly probable that there will be no difference in the effect on the plasmodia whether it is given in one or more doses. For the comfort of the patient it is probably best to divide it into three or four doses to be given with appropriate intervals during the twenty-four hours.

A brief discussion of the form of quinine to be employed may not be amiss. No more specific and effectual form for administration by

mouth is necessary than the ordinary sulphate. It is certainly good enough and far superior to some of the other salts. Quinine is never absorbed from the stomach until it is in solution. It is rapidly absorbed when in solution. Quinine is very sparingly soluble in water or neutral or alkaline fluids. It is very soluble in acid fluids, especially the mineral acids. The reaction of the fluid in a fasting stomach is neutral or alkaline and not acid as is generally supposed. Quinine in solution is a very bad dose and should never be given. The solution should be made in the stomach either by exciting the flow of gastric juice or by administering a little hydrochloric acid. Gastric juice that will dissolve quinine will also dissolve gelatine capsules.

Two other methods of administration deserve consideration, viz., intravenously and hypodermically. Occasionally cases of malaria are met with in which a very large proportion of the patient's red cells are infected and whose lives we consider depend upon getting some quinine into the blood at once. It takes quinine two to eight hours to reach its maximum concentration in the blood when administered by mouth. Again very ill patients may vomit anything given by mouth. In such instances we may resort to the intravenous route and get the effect of quinine at once. A soluble salt, usually the bimuriate, well diluted with salt solution, is to be selected. Ten grains at a dose will kill as many plasmodia as any larger dose. Twenty grains at a dose is not without danger to the patient, and much larger doses intravenously are likely to be destructive. There is no necessity to repeat the dose oftener than every eight hours, and it should be given intravenously only until it can be given by mouth. Quinine intravenously is indicated chiefly in comatose or cerebral malaria. In this form anemia of the brain and coma are produced by the large number of parasites lodged in the capillaries of the brain. They remain in these capillaries many hours, some of them as long as thirty-six hours, and are entirely beyond the reach of quinine in the blood until they segment and their progeny appear in the circulating blood. No amount of quinine in the blood would affect the parasites or change the symptoms until the obstruction to the capillaries is removed. The common practice of putting into such patients large doses of quinine and repeating them frequently until one or two hundred grains have been given because the patient does not become conscious, is most destructive and pernicious. One hundred grains of quinine given in a short time are sufficient to destroy a large per cent of patients, and they really die as a result of treatment and not for lack of it. My opinion is that I have known almost as many patients to die of quinine intoxicants as I have of all forms of malaria. In a number of autopsies on patients who had received large amounts of quinine there were not sufficient parasites to explain death. At this place I would call attention to my theory that nitrites (amyl nitrite) would tend to dislodge parasites from the cerebral capillaries and thereby relieve, to some extent, comatose or cerebral malaria. Best results would be obtained, no doubt, if some quinine had been introduced into the blood previously in order to destroy the parasites when they are dislodged.

Finally we have to discuss the hypodermic administration of quinine. My own opinion is that it has no place in the treatment of malaria and that it may be harmful. The usual dose is ten to fifteen grains of the bimuriate with urea. When this amount is dissolved in the amount of fluid that an ordinary hypodermic syringe will hold, it is very caustic and causes coagulation of the tissue proteids followed by necrosis, which insures against its rapid absorption. If it is diluted sufficiently fifteen or more times it does not cause necrosis of tissue, but simply produces a local inflammatory reaction which, however, does permit the absorption of the drug in a few hours or in a day or two at most. The concentrated solutions may be absorbed in a few days or months, depending upon the rapidity and manner in which the body takes care of the ne-

crotic tissue. In fact, it may slough, and in a few days the quinine will be discharged with the other material from the sloughing tissue.

The slowness and uncertainty with which quinine, when given hypodermically, is absorbed makes it most unreliable. If a patient must have quinine at once it should be given intravenously, or if he can wait a few hours it should be given by mouth.

Malarial hemoglobinuria does not require quinine during the attack because the very condition which produces the hemolysis and consequent hemoglobinuria destroys the plasmodia. Quinine increases hemoglobinuria. After the acute attack the weekly administration of smaller doses of quinine always kills out the remaining sexual infection.

The effect of quinine in malaria is enhanced by giving it on a comparatively empty alimentary canal. A preliminary purgative is therefore serviceable.

741 *Carondelet St.*

MALARIA DURING THE FIRST THREE MONTHS OF LIFE.*

By B. H. Booth, M.D.,
Drew, Miss.

My excuse for this paper is on account of the prevalence of this disease during this period of life in our section, the Yazoo and Mississippi Delta; the attending high mortality owing to this condition not being recognized by the parents, also by it frequently not being recognized by the attending physician when he has been called, as in a young child malaria presents many clinical symptoms different from any other period of life and pursues such a rapid course unless promptly treated; for, owing to the undeveloped condition of the tissues of a very young child, the comparatively rapid changes attending its development, those affections produce rapid, startling changes in the infant's condition, for an apparently healthy, robust-looking child may, when severely infected in the course of a few hours, look as emaciated as if from a continued spell of severe sickness, death even supervening within three or four hours from the clinical onset of the disease.

In children during the first three months of life, the first clinical manifestation of malaria is usually the finding of the child asleep with a high temperature. They may or may not have been cross or irritable, but usually if they have been it has been overlooked by the family. As stated, the first thing that the family discovers of the sickness is finding the baby asleep with fever. On waking him, he is exceedingly cross and irritable, jumping from the slightest noise; he is usually very much nauseated, the stomach rejects everything as soon as it reaches it. The temperature rises rapidly, the pulse is at first full and strong, but as the temperature rises it becomes weak and thready; the skin is dry and hot, feeling almost parched to the touch; the respiration becomes rapid and shallow; the patient is constantly moving his hands and feet and rolling his head from side to side if old enough, and if the fever exceeds 103 degrees F. there are usually convulsions, followed by coma. Owing to the unstable equilibrium of the nervous system, all of the nervous symptoms of a malarial attack are exaggerated, and when the infant begins having convulsions, or goes into a state of coma, unless the fever is speedily reduced and the nervous system fortified, death results in a short time. When the infant has been tided over the paroxysm and the immediate danger of death is passed, it is usually found very much debilitated, which lasts much longer in a young child than in an older one, since in both the plasmodium has destroyed quite a lot of the red corpuscles, which are quickly replaced in an older child, but in the young infant the blood-producing organs are not well developed and there is consequently a diminution of the corpuscular ele-

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ments of the blood, leaving us, clinically speaking, a case of pernicious anaemia.

The child's appetite is now variable; sometimes the stomach is still irritable and easily nauseated, the stools become frequent, watery and have an offensive odor; emaciation is rapid, resulting, if untreated, in a speedy death.

The greatest trouble in making the diagnosis is the danger of mistaking this condition for indigestion or cholera infantum, but the attacks of indigestion usually come on while the child is asleep and usually there have been symptoms of the baby's being unwell noticed by the family, and the abdomen is usually much swollen, while in malaria the abdomen is usually normal in appearance and to the touch, while a microscopical examination of the blood will almost always reveal the malarial plasmodium. If not, the apparent leucocytosis in a case of this kind is almost pathognomonic.

Sometimes, instead of the onset occurring while the child is asleep, the first manifestation of the attack is a convulsion, which comes on without any warning, but after its onset the attack presents practically the same clinical symptoms as already described.

These attacks sometimes occur in very young children. Indeed, I have seen them in children only two weeks old. They occur most frequently in the late summer, being rare after cooler weather sets in. Fortunately, these patients respond much more promptly and satisfactorily to treatment, if instituted in time, than do older children, and their recovery is almost as rapid as the progress of the disease was before treatment.

The usual treatment would be outlined about as follows: Cold baths to reduce the temperature, if practicable, and if not, then hot ones. Small doses of heroin and atropine, or morphine and atropine to control the convulsions and equalize the circulation, not losing sight of the fact that young children as a rule bear morphine badly, hence it must be given very guardedly; a good mercurial purgative (I prefer a mixture of calomel and the time-honored mercury with chalk), followed by plenty of castor oil as hot as can be given; also plenty of the specific, quinine, which can be administered by mouth best in some syrup or the proprietary preparation, euquinine, or used in the form of an inunction; the soluble salts dissolved in alcohol or glycerine, or as I think the preferable mode, by hypodermatic injections of the quinine and urea salt, remembering that an infant of this age will bear well proportionately large doses of both the mercurials and quinine. It seems to me the hypodermatic administration of the quinine is to be preferred to any other, as it is more prompt in its action, more sure in its results and is really easier on the child than either by the mouth or inunction, as it is administered in few doses, is comparatively painless and allows the child more rest, besides being much less trouble to the attendants. After the acute symptoms have subsided, iron in such forms as to be easily assimilated, with essence of pepsin in appropriate doses will cause a quick recovery from the emaciated condition. These directions, of course, are only as a guide, for the practitioner will soon find that almost every case presents differences in the symptoms and attending conditions, and that every case must be treated individually and not by routine methods.

DISCUSSION SYMPOSIUM ON MALARIA.

(Papers of Drs. Von Ezdorf, Shoulders, Bass and Booth.)

Dr. William Krauss, Memphis.—The official opener of the discussion is manifestly at a disadvantage when he does not know what he is going to discuss until he has heard the papers. This is especially the case with such a large subject as the subject of malaria. There is no way in which one can prepare what he is going to say in advance, and necessarily his remarks will not be as well chosen as they would be otherwise.

Dr. Von Ezdorf brought out an important point which the practitioner is apt to look upon lightly, and that is the necessity for careful differentiation of the species, because treatment to a large extent depends upon it. The prognosis in the case and the epidemiological features of the situation depend upon it. We cannot always make a diagnosis on the ground of the clinical symptoms. Estivo-autumnal malaria may simulate benign tertain closely if we lose sight of the fact or are unable to determine the duration of the paroxysm.

We may make a mistake in taking the tertian for the quartan by reason of omission of a paroxysm in the curable tertian, and in a variety of ways we are misled by the clinical symptoms. I think all lecture campaigns should include a plan of procedure in the locality in which the lecture is held. I do not think we should simply leave the audience with a brilliant lot of platitudes without offering any remedy in the way of solution of the local problem. Some of the features of Dr. Shoulder's address are a kind of academic conception of the situation which we are here to dispel. If we take, for instance, the statement that the harborers of gametes should be screened, we are evidently cognizant of the fact that the development of gametes is more apt to be later, when the patient is usually up and about, and how are you going to screen such a person? Another statement, which, of course, is backed by epidemiologists and malariographers, is to the effect that if you eradicate mosquitos within a given area you are meeting the situation to a limited extent, but that is not applicable in such an instance as this: a group of people congregate for hours in a public place or places; the people, we will say, come from the surrounding country, and congregate in a place like the court house during a trial. Now, that court house is never screened; the gamete carriers congregate there and in the course of time infected mosquitos will be in that building. Now, an individual goes home from there and develops malarial fever. His locality may not be under treatment for carriers, and a new focus is started. These are details which do not work out along academic lines. We must understand the thing from start to finish. (Warning from the chair that time was up.) In that case the most important thing I can say now is, we must also recognize the gametes in the formative stage when amenable to treatment.

The best treatment of gamete carriers is their prevention, and best way of breaking up an epidemic is the complete eradication of the infection while you have got the patient under treatment. That is a very important thing, and then we must tell that individual what he is to do. We must force home to him his individual responsibility to his surroundings before we let him go from the hospital, so that he will appreciate the fact that he is liable to be a menace to his neighbors and to his family.

Dr. I. L. Van Zandt, Fort Worth, Texas.—I grew up too soon to be taught bacteriology in my young days, but there is no one more interested in the progress that our young men are making than I, and I want to congratulate the profession and the world on this progress.

Dr. Bass explains to me why I have been successful in getting rid of chills and fever. I began forty-eight years ago giving a little quinine every day, and my patients went along having chills. Unless I filled them up every day, they had chills. Later I fell upon the plan of having iron and arsenic given daily as a tonic, and quinine regularly once a week for several weeks, and where the cases were not reinfected, I succeeded in getting rid of the chills.

In infants with convulsions I have poured cold water on the head with remarkably good effects, convulsions ceasing and the child going to sleep. Later, if the head begins to move with twisting about of the upper extremities, I look out for a recurrence of the convulsion and pour on the water again.

With regard to the use of purgatives, I must confess I have not been much of an advocate of them in malaria. Chills may cause biliousness, but biliousness never causes chills.

With regard to inunctions of quinine, I have succeeded fairly well in babies under six months old.

Though forty years have passed since my first experience with a congestive chill, the details are still firmly fixed in my mind. The patient was a middle-aged man; pulse was feeble and rapid; respiration sighing. He wanted fresh air, which, though furnished in abundance, failed to supply the much-needed oxygen. The whole skin was blue, soft and moist, and cold as that of a dead man. The hands were shriveled; the tongue, but slightly coated, was pale and slightly blue. Notwithstanding his appearance of being cold, the patient clamored for cold water, which was no sooner swallowed than vomited, as was everything else. The vomited water was mixed with a little mucus or bile, or with blood simulating the discharges from the bowel. Bowel discharges were most constant and characteristically serosanguinous, being best likened to the washings of bloody meat. The condition very much resembled the collapse of cholera, except in the substitution of the bloody water for the rice water discharges.

I tried to follow the treatment laid down in the current text-books, yet this patient died. I studied the books more closely, yet my next two cases died also. These patients were all taken early in the day and died the next morning, no reaction having occurred. I became dissatisfied with the treatment in the books, arguing thus: In these cases the skin is blue, cold and moist; now, if it can only be made red, hot and dry my patient will be relieved—not cured, for this must be done by the preparations of cinchona.

Belladonna suggested itself to me as a fit agent. But when the next case came, I hesitated to lead out and abandon the directions of the authorities. The patient was taken in the morning. I watched him all day and up to midnight, following in the footsteps of the others. By this time he was comatose, his pulse a mere thread. I now became desperate. Dissolving one-fourth grain of solid extract of belladonna in a few drops of water, I gave it hypodermatically. Waiting an hour and seeing my patient no worse, I gave a second dose. In twenty minutes, the pulse and general conditions showing signs of improvement, I made ready and gave the third dose. Soon after this the patient became conscious, reacting nicely.

Since that time I have treated several cases, always with success, latterly substituting atropin sulphate for the belladonna.

Dr. J. E. Paullin, Atlanta, Ga.—I have enjoyed Dr. Bass' paper very much indeed. I would like to ask him what he does for people who are infected with malarial parasites who cannot take quinine. Unfortunately I happen to be one of those individuals who is peculiarly susceptible to this drug, and if I take thirty grains of quinine

a day, or even ten grains a day, small as I am, it would take three or four men to hold me in bed. There are certain arsenical preparations that are recommended for use. I would like to ask Dr. Bass if he has observed whether arsenic has any effect in destroying the malarial parasites.

Dr. E. C. Thrash, Atlanta, Ga.—Reasoning from analogy, I have in quite a number of cases used salvarsan in chronic estivo-autumnal malaria where I could not get results from quinine. A number of students have come from the southern part of Georgia and Florida who suffered from malaria, who would get worse after they remained in Atlanta for a few weeks. Quinine did not meet the indications at all. The four cases I have treated with salvarsan all got well. I gave one patient as many as three doses. Whether this is a coincidence or the salvarsan brought about a permanent cure, I cannot say, because the treatment of four cases would be practically of little value in arriving at conclusions.

Dr. Rucker, Memphis, Tenn.—I think the work done by Dr. Von Ezdorf is extremely interesting, and when he has carried it further I think it will result in remarkable good in the eradication of malaria.

In the 2,500 cases which he examined, I would like to ask him in what proportion parasites appeared in the blood, and what proportion of these were microgametocytes. We are all perfectly familiar with the reports of research workers in the tropics who contend that the presence of parasites in the blood in 10 per cent is an index of the prevalence of this condition. I ask this question because in my early work in malaria I somewhat questioned the accuracy of these results, especially whether or not the condition prevailed in this country to the extent indicated by the reports from the tropics. Of course, I have made no extensive investigations along this line, but my experience has been that children, especially in the Mississippi delta who do not present symptoms of malaria very rarely present parasites in the blood.

Dr. Stewart R. Roberts, Atlanta, Ga.—The point raised by Dr. Paullin is an interesting one, and it is very practical. There are unquestionably a number of patients affected with malaria who are unable to take quinine because it is a drug that has a toxic effect. They have an idiosyncrasy toward quinine; they cannot take it without pronounced toxic symptoms. In the second case there is another group of patients, a larger group than the first, who cannot take quinine without having pronounced nervous symptoms, and regarding that I am referring not simply to the ringing in the ears, but a pronounced nervous condition which prevents sleep and rest and makes the patient decidedly uncomfortable. The largest group of patients in Texas with malaria can take quinine without trouble. It is doubtful in my mind whether it is wise to give pure quinine to any real civilized person for long periods by itself. I learned this from Dr. Earnest, in Atlanta, who says that there are patients to whom quinine is directly toxic. If the doses are repeated within one hour with large doses of sodium bromide it has a sedative effect upon the system and prevents the toxic effect of the quinine. One should give anywhere from 15 to 30 grains of the bromide of sodium one or two hours before a dose of quinine.

I have given quinine to the chronic cases of malaria in Atlanta with either antipyrin or aspirin, and if the patient is a young adult, strong, with a good heart, I give a grain of phenacetin with four grains of quinine. Larger doses of antipyrin can be given with quinine than with phenacetin, because there is a more depressing action following the use of phenacetin. But if one gives one or three or four grains of quinine, the nervous symptoms characteristic of a group of patients who react with difficulty can be done away with. Sodium bromide has never failed in the few cases in which I have used it who manifested a reaction to the quinine. It does not seem to me that quinine will cure malarial cachexia. With a malarial nephritis, just what effect the quinine has on the liver I do not know. Certainly, I think we all agree that as soon as we get rid of the biliousness in technical medicine, the better for medicine.

A doctor in last week's issue of the New York Medical Journal described his personal experience with chronic malarial infection and quinine in all forms of doses extending over many months until relief was afforded by one dose of neosalvarsan. If neosalvarsan is so readily given, where we have symptoms it is certainly worth trying.

Dr. D. M. Molloy, Manila, Philippine Islands.—I have been very much interested in this discussion and since I have had a rather large experience in the treatment of malaria in one of our tropical possessions I would like to give the association the benefit of some of my experience. I want to call attention to the fact that throughout the whole of this discussion so far the best form in which to administer quinine has been entirely overlooked. Dr. Bass, not having had time to do so in his paper, will doubtless bring this out in closing the discussion. But we have all been impressed for a long time that the treatment of malaria by ordinary methods would not prevent relapses. We all know now that the vigorous treatment of malaria in the primary stages of infection is the most important method of preventing malarial relapses. The danger of giving quinine by the slipshod methods that are too frequently used in the South by practitioners cannot be too strongly condemned or emphasized. The administration of quinine in small doses in capsules, in pills, in tablets that are practically inert, is absolutely criminal

Now, gentlemen, I quite agree with Dr. Bass as to the doses of quinine necessary in the primary stages to prevent relapse, but I want to call your attention to the fact that if you give quinine, even in thirty-grain doses a day, in capsules, tablets or pills, you will frequently not get results which you expect, and you are likely to do more harm than if you gave him no quinine at all. It has been my rule for a number of years to give quinine always in solution, and I believe that this rule, with rare exceptions, should never be varied from. Quinine sulphate in powder form is practically inert in the great number of cases of malaria on account of the inability of the stomach to absorb it. Quinine bisulphate is a most active salt in powder form.

I wish to call attention to two cases which are

very typical or illustrative of this one fact. About a year and a half ago in the Philippine General Hospital I had a patient under my care who had been treated some three or four months before by the usual method for primary infection of the estivo-autumnal type. He was given quinine by mouth until the symptoms were controlled. He went back to his work, which was in a malarial district after the first primary infection, and in the course of three or four weeks he returned to the hospital with a relapse. At this time he was given quinine a little more vigorously in small doses hypodermically or intramuscularly. A little later he came back to the hospital in a badly run down condition, cachectic and suffering from chronic malaria. Since my time has expired, I should like to ask the privilege of extending my remarks in the record.

Dr. D. M. Molloy.—I instituted the use of the bihydrochloride of quinine and urea intravenously in the Philippines General Hospital more than three years ago, and it was used in the more severe infections of estivo-autumnal malaria for some time before we began treating all estivo-autumnal infections by this method. We gave 1.00 to 1.25 gm. in ordinary cases dissolved in 250 to 350 c.c. of salt solution and injected this solution into the median-basilic vein with a "606" apparatus. It was given during the stage of pyrexia or in the interval, just as we happened to get the patient. Our results were uniformly good, but it soon became apparent that the method was of exceptional value in the treatment of the so-called "chronic" malaria or the chronically relapsing cases of malaria. One such case was the one referred to when my time expired and which I wish to relate more in detail:

A. Y., American civil engineer, contracted estivo-autumnal malaria in Mindonora in August, 1911. He was treated in a hospital by the usual method—quinine by mouth—until the attack was controlled. The patient left the hospital in fairly good condition, but a few crescents could still be found in the blood. He returned to the hospital in September "all run down," as he expressed it, but had had no paroxyms during the interval and had no fever at the time of admission to the hospital. Blood examination showed a few crescents. The patient was anaemic, almost cachenic; the spleen was palpable, liver enlarged, red cell count 3,500,000 hemoglobin 40 per cent. He was given daily doses of quinine hypochloride gm. 1.00 intramuscularly, later supplemented by gms. 1.60 by mouth. In addition he was given the usual iron and arsenic tonics. Improvement was slow and the patient was discharged but little improved after two weeks in the hospital. No parasites were found in the peripheral circulation at the time of discharge from the hospital. In November he returned to the hospital in worse condition than before, but had had no recurrence of the febrile attack, and had consistently taken an anti-malarial "tonic" which had been prescribed for him on his second discharge from the hospital.

Blood examination still showed crescents; the patient had lost flesh and was so weak as to be absolutely incapable of performing his duties. Some edema of the extremities had developed and the patient was suffering from a profound secondary anemia. He was given gm. 1.30 of the bihydrochloride of quinine and urea intravenously every other day for three doses, then gms. 2.00 every third day for a week. The drug was given in 300 cc. of salt solution, as outlined above.

The improvement in his condition was so rapid as to be almost marvelous. The most noticeable thing after the first injection was a great increase in appetite, his appetite becoming voracious after the third injection. Blood examination showed no crescents after the third injection; the improvement in his general condition was marked; the gain in weight almost phenomenal (11 pounds in the first week after the first injection, and a total gain of 16 pounds in three weeks—the time in hospital) and the patient was discharged a new man at the end of the third week.

Subsequent blood examination failed to reveal the presence of any organisms, and he sent in a regular monthly report of his condition, accompanied by a blood smear made by the company physician.

This is only one of several similar cases treated by this method, and I assure you the results were remarkable—not all so remarkable as this one, but far outreaching the effect of any treatment I have seen used before.

A case which is illustrative of the efficacy of this treatment in preventing relapses in severe infections of estivo-autumnal malaria is that of one of the overseers of the Iwahig Penal Colony. This man, also an American, contracted a severe estivo-autumnal malaria on the Island of Palawan, in May, 1912, and with no treatment, except a preliminary mercurial purge, was brought to the hospital on the third day of the disease. On admission the patient was semi-comatose, temperature 104.5 F. and blood examination showed an extremely heavy infection. He was given 1.60 gms. of quinine and urea bihydrochloride by the method already described immediately. This injection was repeated the next day when the temperature reached normal. He was given an injection the second day following and was discharged from the hospital at the end of a week. The patient was given no quinine after being discharged from the hospital and eleven months after was still clear of any signs of malaria and no parasites were found in the blood subsequent to his discharge from the hospital, although repeated examinations were made.

Realizing that this method is not unattended by danger, I do not advocate its use in all cases of estivo-autumnal malaria, but I do wish to impress upon the physicians present that it is not attended with the grave dangers which are usually supposed to attend the administration of quinine intravenously. Where the infection is very severe and pernicious malaria threatens, it is undoubtedly the most effective method we have of administering quinine and will prevent many cases of the so-called pernicious malaria, if used properly. In the treatment of the pernicious types, particularly the cerebral type, it is the method par excellence, as we all know. In my opinion the introduction of 350 to 500 cc. of warm normal salt solution into the veins is of great value in the pernicious types of malaria, since this method will aid in dislodging the parasites which have blocked

the capillaries in the brain and other parts of the body, and, in addition, the quinine present will destroy such parasites as are circulating freely in the blood or are dislodged from the capillaries.

It may also be true that the introduction of quinine in such a quantity as to make practically a 1,10000 solution of quinine in the blood stream "activates," if I may use such an expression, the parasites that have developed a resistance against quinine and causes them to sporulate. The quinine is then present to destroy these young parasites and they have no opportunity of developing into the resistant forms.

This may explain the results which have been obtained in the treatment of chronically relapsing cases by this method.

The administration of quinine in too concentrated a solution cannot be too strongly condemned. Thayer reports a death due to the intravenous administration of quinine in the Bulletin of Johns Hopkins Hospital of April, 1911. One such case occurred in our service and in both cases the quinine was administered in a dilution of less than 1 to 100, and in Thayer's case the dilution was 1 to 50. Where the quinine was administered in large quantities of salt solution we had no very unpleasant symptoms from its administration intravenously.

In reference to the treatment of malaria by hypodermic injections of quinine mentioned by Dr. Booth, I wish to state that I have had excellent results from the treatment of malaria by intramuscular injections of the salt already mentioned. Quinine—any sort—is prone to produce abscesses when administered subcutaneously or intramuscularly, and to obviate this danger and assure its speedy absorption it must always be given in a large quantity of water. The dilution should never be higher than 1 to 10, and still better 1 to 20. The ordinary hypodermic syringe is not a fit instrument for the administration of quinine intramuscularly. It should be given with an all-glass syringe of either the Leur or Record pattern of not less than a 12 to 20 cc. capacity, and the solution should be introduced slowly in order to allow its dissemination between the muscle fibres. I much prefer giving infants and young children who are suffering from malaria quinine by hypodermo-clysis when they are unable to take it by mouth. The dose of quinine and urea decided upon should be dissolved in 100 to 150 cc. of salt solution and introduced slowly into the deep cellular tissues by a needle attached to the delivery tube of either a fountain syringe or an ordinary irrigator. Quinine given in this way is much more slowly absorbed than when given intramuscularly and immediate results are not always forthcoming. This method is extremely valuable in the treatment of infants who cannot take quinine either on account of the taste or on account of persistent nausea, coma, or other attendant symptoms of malaria. I do not believe that the administration of quinine by inunction is effective on account of the fact that quinine is not absorbed in an alkaline medium and the secretions of the skin are, as you all know, alkaline. If any of the quinine is absorbed, it is, my opinion, only a very small amount and will do little toward the ultimate cure of the condition.

Finally, I should like to impress upon all the members of this section the importance of instructing the people of the dangers of taking quinine in insufficient quantities in attempting to break up "chills and fever," since in that way they very frequently cause a condition which is, when properly treated, easily cured, and for which we have the only perfect specific known to medicine, to become a chronic condition which will resist all ordinary methods of treatment, thus fixing upon themselves a chronic condition which might easily have been cured in the early stages of the disease by the proper administration of the specific, quinine.

Dr. William Litterer, Nashville.—The work that has been conducted by Dr. Von Ezdorf is far reaching in its importance. I do not think we have any idea as to the great good that will come from it His work is certainly to be highly commended.

The theory of Dr. Bass is unique, and it is, I believe, on the right track in explaining in a scientific way the basis on which quinine fails to act in these malignant cases of malaria.

Quite recently there has been some work done by Thompson and Thompson, studying under Ross at the Liverpool School of Medicine, in which they explain why quinine does not act in the malignant form of the tertian type of malaria as compared with the non-malignint type of tertian malaria. They use Dr. Bass' method of cultivation of the parasites and claim that in the malignant type of tertian malaria that culturally they would clump, whereas in the non-malignant type of tertain malaria they did not clump. From their experiments they concluded that the clump forms would lodge in the capillaries, plugging them up, and therefore quinine would not get into the circulation or attack the parasites while they were in the embolic state.

Dr. F. A. Coward, Columbia, S. C.—I have heard several of the speakers mention the use of salvarsan in the treatment of cases of chronic malaria. I have recently been doing some work an account of which I think might be presented here. While our work is not completed, and it is inconclusive, it may suggest to some of you the relative value of quinine and salvarsan or neosalvarsan.

Following the suggestion of Moon, who developed rabies in dogs by the use of quinine administered by the mouth or hypodermically, the State Board of Health of South Carolina took up the work, and we have experimented with twelve or sixteen rabbits. We have used not only the bimuriate of quinine, but salvarsan in parallel work, the work being controlled by untreated rabbits as well as inoculated rabbits untreated with drugs. So far our work has been confined largely to prophylaxis. We have not attempted to cure the developed disease, Moon has done that. We may eventually substitute drug treatment for a part of the tedious Pasteur treatment of three weeks' duration. Quinine undoubtedly has some effect on the parasites of rabies, and it has prolonged the incubation period several days beyond its usual course, that is, using the fixed virus. The use of salvarsan in doses slightly larger than we would dare give in general practice, had no

effect in postponing the onset of the disease. I used in these rabbits the equivalent of about 4-10 grams of salvarsan. Some of the rabbits having developed rabies, received a dose equivalent to 5-10 gram. The first case received 7-10 or 9-10 gram of old salvarsan, but it had no effect that I could notice.

Dr. Von Ezdorf will tell you in our city of Columbia there are several cases of physicians whom he saw and met, and I know of others who have gone to their physicians and would gladly undergo the administration intravenously of salvarsan if they could be convinced that chronic recurring attacks of malaria and the secondary effects could be prevented by that drug, but I do not believe there is any analogy between the parasite of rabies and of malaria, although both are protozoan. We need to experiment further with salvarsan, but we are learning more and more about quinine.

Another point: I think those who are connected with medical colleges are doing wrong to the young men of the medical profession in telling them to treat their cases of malaria with quinine, and that everybody can take it. Everybody cannot take quinine. I spent two years in the tropics of South America and know whereof I speak. We had quinine put up in capsules of five grains each and gave them three times a day. We found there were people who could not take quinine.

Dr. Louis Leroy, Memphis.—The subject of those who are unable to take quinine is always interesting, and it is a fact that occasionally no matter what is done, the patient is unable to take quinine. I have used bromides to assist some cases. I have used morphine with benefit in other cases, and I believe perhaps salicylic acid or aspirin has given the best results of anything, although a reasonable amount of reaction occurred. There are still some patients who can scarcely tolerate it under these circumstances. I have had some success and satisfaction with the use of an old remedy which we have pretty well discarded as a rule, and that is salicin. This is a marked anti-malarial remedy which will give some benefit and will tend to eradicate malaria.

Another thing should be emphasized at this meeting: If there is a curse from which the South is suffering it is the nefarious chill tonic which is found on every grocery store shelf, and the reason for that is twofold. In the first place, the majority of them are not made from quinine, but from various refuses of the quinine factories They will unfortunately break up a chill, but they will not kill the malarial parasites. The parasite develops quinine immunity and it is extremely refractory to quinine subsequently. The cycle is broken up, and almost without exception, in my city hospital work, from the surrounding states, Mississippi and across in Arkansas and along the Mississippi, we have derelicts drifting in with cerebral malaria, with the spleen half way down to the symphysis, with anemia that is refractory to almost anything we can do. They have been brought to this condition not so much by malaria as by the chill tonic that permitted them to go on in this way. Had they taken nothing, it would be easier for them to undergo treatment, and not made human derelicts as they are today. It is the chill tonic which is responsible for the gamete carriers more than any other one thing.

There are two things that should be done in our river surroundings if they can be accomplished. I have tried for some time to get a ward in the city hospital screened so as to put our malaria patients in there, and not endanger our typhoid and other patients who necessarily have to be there for some time. The river front is so near the city that a man working there runs a good chance of having malaria inoculated into him. There should be some renovation of the river front. The houseboat dwellers which infest the river and occupy the whole river front should be made to go ashore and live or move out of town limits and screen out mosquitoes and flies.

Dr. Charles L. Minor, Asheville, N. C.—While speaking of the use of quinine in malaria, we should not forget other valuable remedies. I have obtained good results in chronic cases by the use of methylene blue, five grains to fifteen grains three times a day; usually the stomach will tolerate it well, though not always. Sometimes the pronounced blue color in the urine frightens the patients and they should be warned of it beforehand. I would also like to ask Dr. Bass the size of his first dose of quinine.

Dr. E. H. Martin, Hot Springs, Ark.—I do not believe that salvarsan or neo-salvarsan will ever be used in the treatment of malaria, because we have a much better substitute for quinine than salvarsan in sodium arsanilate, known under the trade name as soamin.

I have demonstrated on many occasions that salvarsan does not have any effect whatever upon the malarial parasite, at least not upon the asexual forms. "606" may have some effect on the sexual types of plasmodia, such as are supposed to cause chronic malaria, but I have no proof of this.

I do know, however, that soamin in three or four grain doses subcutaneously every other day will rapidly cure what we call chronic malaria, or in other words, malaria which quinine does not cure readily.

There are certain preparations on the market containing all of the alkaloids of cinchona bark, in the same proportion as they occur in the bark itself. I have found these combined alkaloids much more efficacious in treating malaria than sulphate of quinine alone. Not only is a smaller dose required but there is much less distressing symptoms of cinchonism.

With these combined alkaloids and soamin we should have no difficulty in controlling malarial poisoning of any type.

Dr. Bass has declared against the use of quinine subcutaneously. I think the objections to this method of administration can be overcome by using normal salt solution in which to dissolve the bimuriate of quinine and urea and by making the solution very dilute, not more than one grain to the c.c.

The intravenous method will not be needed so often for the simple reason that those patients who cannot take quinine by the mouth with results are the little folks. It is very seldom that an adult cannot be given quinine in the usual way, but children frequently will not retain or absorb

quinine from the stomach and in such cases quinine must be given some other way and given quickly in order to save life.

These little ones have very small veins and are very much frightened at even a subcutaneous administration. It would be very difficult to get them to hold still long enough to give them quinine intravenously.

While there may be a place for the intravenous use of quinine, and there certainly is a very important place for the subcutaneous and intramuscular use of quinine, I fully agree with Dr. Bass that it is much better to give it by the mouth when we can get results that way.

Dr. Geo. E. Pettey, Memphis, Tenn.—One of the essayists mentions the administration of quinine to children by inunction, but does not seem to regard that method of administration of much importance. However, to get the full dose of quinine into the blood of the patient is the most important step in the successful treatment of these cases. It is not always easy to do this and a physician often thinks he has cinchonized his patient when he has not done so.

The inunction method, properly employed, is by far the most satisfactory and dependable, and the dose can be gotten into the blood more promptly by it than either by the stomach or hypodermatic administration.

The principles involved in the successful administration of any substance by inunction are, that the remedy must be soluble in the medium employed, and the compound, when completed, must have such chemical affinity for the blood as to induce osmotic action when applied to the skin, or to have such physical properties as to admit of being forced through the skin by mechanical pressure.

None of the salts of quinine are soluble in lard or vaseline, and it is certain that these substances have no chemical affinity for an alkaline watery solution like the blood. Crystalline substances do not admit of being forced through the skin mechanically, therefore it would seem quite unreasonable to undertake to administer quinine by inunction in such a medium. Lanolin is better, because it is more miscible with the blood, and when inunction is to be carried out simply as a mechanical process, as in the use of mercury by inunction, it is an ideal medium, but it is not a satisfactory medium for quinine inunction because quinine is not soluble in it and crystalline substances cannot be made to pass through the integument unless they are in solution. There is, however, a medium in which some of the salts of quinine may be administered by inunction with perfect success. It is glycerine. The muriate and bisulphate of quinine are perfectly soluble in warm glycerine in the proportion of one part of quinine to three parts of glycerine, thus making a 25 per cent solution of quinine. The glycerine of this compound has such an affinity for the water of the blood that it passes readily through the integument and carries with it the quinine which it holds in perfect solution. Neither the sulphate nor bromide of quinine are soluble in glycerine, and therefore, are not fit to be used in this way.

In the more severe forms of pernicious malarial diseases, if quinine is administered by the stomach, rectum or even hypodermatically, the absorbents may be so deranged that they will not take it up, but so long as the blood is circulating, if one of the soluble salts of quinine be dissolved in glycerine and applied to the skin it will pass into the blood, the skin acting merely as a dialyzing membrane. This is essentially a chemical process, and its success does not depend upon the activity of the secretions or, in fact, on any of the vital functions except the circulation of the blood.

A patient can be quininized as promptly and as thoroughly by inunction with this glycerole of quinine as by any other mode of administration, and it is certainly much to be preferred to the hypodermatic method. This mode of administration of quinine is suitable for either adults or children; but in estimating the dose allowance should be made for waste because of contact with the clothing before all the compound has been taken up. Gentle friction should be used for a few minutes after applying the remedy, as this stimulation of the capillary circulation will hasten the taking up of the glycerole. A convenient form of ordering this compound is: Quinine muriate, 2 dr.; Glycerine (warm) 6 dr.; M. ft. sol. Sig: 2 dr. as inunction for adult.

Dr. James V. Freeman, Jacksonville, Fla.—I think we all recognize the great debt we owe Dr. Bass for his splendid research work in malaria, and I hope he may continue to instruct us for many, many years. No one, I'm sure, will quarrel with his statement that quinine is the best treatment for malaria, although we may have some difference of opinion as to the best way to administer it.

Personally, I should say that the intravenous method was easily the best, the hypodermic method next best and administration by mouth the least effective method, although the one most often used.

I differ entirely with Dr. Bass about the hypodermic use of the drug. Quinine salts injected under the skin are not only absorbed readily, and do not cause necrosis, but often control the disease when full doses by mouth fail to do so. I am certain that most of you will back me up in this statement. It is just as rational to employ quinine hypodermically as strychnine, and it can be done as readily and as safely.

As to arsenic, I again differ directly with Dr. Bass. It will control malaria and it will do it when quinine has failed. Just as the old practitioners knew that malarial fevers were prone to relapse on the seventh, fourteenth, twenty-first and twenty-eighth days, so they guarded against these relapses mostly by the use of small doses of quinine combined with arsenic, and successfully, too.

If the small doses of quinine favor the formation of gametes and the perpetuation of the infection, then the value in the formula must cling to the arsenic itself. It must be remembered that the specific action of quinine in malaria was known before the plasmodium was discovered, and that the periodicity of the disease was recognized before the life cycle of plasmodia was worked out; so also we know that arsenic will do the work, although we can't explain how it is done.

I worked for five months over a relapsing case of tertian malaria last winter, employing quinine in every way except intravenously, then cured the case up promptly with some five or six hypodermic doses of atoxyl. It has stayed well since.

I hope Dr. Bass will make a special investigation of the way in which arsenic acts.

Dr. Graham E. Henson, Jacksonville.—An important point brought out by Dr. Shoulders, and one that cannot be emphasized too strongly or too often, is the fact that the sexual cycle has to cease wherever a temperature of 65 degrees F., or less, is maintained. It has not, I believe, been absolutely determined at what temperature the sporozoites and other forms of the plasmodia, undergoing development within the mosquito, will die, but sufficient data is available to satisfy ourselves that there is a season each year within the entire temperate zone that sterilizes the mosquito. If the circulation of man could, during the same period, be freed of both asexual and sexual parasites, malaria would become extinct—and remain so.

The question of suceptibility to quinine is one that should not be passed over lightly. While there are some individuals, no doubt, who are unable to take quinine—the number relatively is a negative factor—while if the word of the populace was accepted it would be a very positive one. In the administration of quinine in therapeutic doses for the cure of malaria to several thousand individuals, I have yet to see the patient who is unable to take the drug, but have seen hundreds who said they could not. I take issue with Dr. Molloy regarding the method he advocates for the administration of quinine. Theoretically, a solution is the most efficient, practically; it cannot be used in private work, nor is it necessary. Select for the drug a high-grade gelatin capsule, or a cache, and at the same time this is swallowed give the patient fifteen or twenty drops of dilute hydrochloric acid, well diluted, then the necessary solution is made in the stomach and the patient saved a nauseous dose. In practically all instances where quinine does not cure malaria, one of two things are at fault—your method of administering, and of dosage of, quinine—or your diagnosis.

Dr. R. H. Von Ezdorf, Mobile (closing the discussion on his part).—There are two points to be answered, which were brought out in the discussion of the subject, one with reference to the lectures that should be planned, and should include local conditions when taking up the educational feature. I wish to say and repeat, that before giving any lectures either in the community or lectures at schools, I have invariably studied local conditions, and I believe it is absolutely necessary for all health authorities to study local conditions before discussing the subject before the community in order that they will be thoroughly informed as to what they ought to do and also how to do it.

With reference to my index work, I have not determined the proportion ofthe female to the male gametes. That would have no practical bearing in an investigation. When we consider the time required for making blood smears, fixing and staining, and examination, we can estimate that it will take an average of one hour for each individual. I cannot do more than simply determine the presence and the type of the parasite. Such determination will not only be for the good of the individual, but also for the good of the community. What we are after is not generalized statements of the prevalence of malaria over the south, but exact data regarding the prevalence and geographic distribution in the south.

Dr. H. H. Shoulders, Nashville, Tenn.—With reference to the academic nature of my paper, in which I refer to screening malarial cases, will say I regret very much that I created the impression I did. I never recommended the screening of all malarial cases. My reference was in regard to screening the acute cases, inasmuch as the acute cases might be a relapse, and, therefore, a gamete carrier, my reference to the acute cases was as follows:

If it is true that it is not a gamete carrier, the screening of acute cases would be unwarranted. Screening has not been abandoned in the Philippine Islands, nor in the southern hospitals. So far as screening being relied on for the eradication of the disease, I did not mean that. My reference to screening chronic malarial carriers was to the effect that it would be utterly impracticable at present. It seems to me that we have two measures which we must chiefly rely on, and they are the destruction of the breeding places of mosquitoes, and that work does not have to be of such an extensive character to be of great value.

The next method made possible by the investigation of Dr. Bass, I believe, will receive its just tribute when malaria shall have been eradicated. His work has brought about the possibility of eradicating malaria by the proper treatment of cases, and the proper handling of chronic carriers.

Dr. C. C. Bass, New Orleans (closing the discussion on his part)—A number of points have been raised in the discussion. Cerebral or comatose malaria is the cause of death of more than fifty per cent of the fatal cases of malaria. I believe that can be stated as applicable to this country purely, so that is why malaria is more malignant and why it prevails. Cerebral malaria has a destructive influence in over fifty per cent. of the cases. When a sufficient number of the parasites lodge in the brain to cause a sufficient degree of anemia the patient goes to sleep or becomes comatose. He stays in that condition until the anemia is relieved. As I understand, quinine does not reach these parasites in the brain, and we can kill a patient with 100 grains of quinine in twenty-four hours. I believe I can say truthfully after all the autopsies I have seen on cases of supposed malaria, I am quite confident that half of them did not have malaria to kill them; that they were not killed by malaria; that a vast majority of them had had 100 grains of quinine during the last thirty-six hours of their lives; that quinine used intravenously in more than about twenty grains at a dose is a dangerous measure. There is the possibility that we might dislodge or relieve anemia of the brain or dislodge the parasites in the capillaries by dilating them with amyl nitrite, but if we let a normal man who is asleep inhale a whiff or two of amyl nitrite he wakes up. It is quite possible that he will wake up and be relieved

temporarily of the comatose malaria in the vast majority of instances. But that is experimental, and I would not advise it in the human subject.

As to the form in which quinine should be given, I take issue with anybody who believes there is no other form of quinine that will kill the schizodont than sulphate of quinine. Sulphate of quinine and most other forms of quinine are not absorbed, and, therefore, do not go into the blood of the patient, and where the parasites are naturally brought into solution. Quinine sulphate in other forms is insoluble in neutral media. The way to dissolve quinine is not to give it to a sick man in solution, but give him quinine, and to bring it into solution give him a cracker to stimulate the hydrochloric acid or give him hydrochloric acid without the cracker, as you choose.

One must deplore some of the things that have been said in this discussion. It is the most antagonistic evidence I can see against the possible eradication of malaria, particularly the remarks of competent men like Dr. Paullin and Dr. Molloy, who say that there are people who cannot take quinine. Just so long as the medical profession supports any such views as that, just so long we will have malaria, and whenever we put such a view aside we will have made a great step toward the eradication of malaria. As for the fact that quinine makes the ears ring, nobody questions that, but which is preferable, the quinine effect or the chills and fever effect of the malaria? I grant you there are certain individuals who are especially susceptible to the influence of quinine; that there are certain individuals who would be affected by the drug, but that is no argument against the use of quinine. Quinine in my judgment, and I am confident I am right, does not kill the parasites directly, but it does it by causing edema of the so-called crippled cell. Quinine given to such susceptible individuals gives them edema of tissue, and there are many people who have urticaria, etc., following the administration of quinine. It is the action of quinine which kills the parasites. A patient who is especially susceptible may get urticara from the administration of ten grains of quinine, but most people lying in bed do not worry about thirty grains of quinine. It does not hurt them as bad as malaria would hurt them.

Another deplorable thing is the opinion of my good friend, Dr. Thrash, that perhaps salvarsan or some other drug—I do not care what it is—should be made use of as a specific treatment for malaria. In quinine we have the most perfect specific in medicine. There is nothing equal to it, and there are no exceptions to that statement—in bringing about a cure, and yet we are hunting for specifics for hookworm disease and round worm.

With regard to the chill tonic, the action of that tonic is harmful, and the contrary thing in my opinion is the giving of quinine at intervals and in divided doses. If we take some of the other shop stuff, like morphine; if we give a man one-fourth of a grain of morphine it puts him to sleep. If we give him another dose the next day and keep on giving it, after a few doses he will be taking twice as much to accomplish the same results, and in a few weeks he will take many grains without hurting him. What happens? That patient has some tissue in his body that is capable of neutralizing, destroying, or antagonizing the morphine and alcohol. Take a man who smokes cigarettes and inhales the smoke, he does not feel the effects of it markedly, but let that man for one week not smoke or inhale any nicotine at all, and then smoke a cigarette and inhale the smoke, the same size dose of nicotine does the business the next time when you have an interval, whereas, before you took many times the same quantity without accomplishing the same results. If we take a dose continuously we acquire somewhere the capacity of destroying or neutralizing the quinine and of interfering with its good action.

As to the hypodermic administration of quinine, in my judgment there is no place in the treatment of malaria for hypodermic injections of quinine. Ten or five grains of whatever salt you use dissolved in the ordinary quantity of water, when injected under the tissues, causes necrosis of the tissues. If we take that solution and drop blood into it, it causes coagulation of blood; it causes necrosis of the tissues if ordinarily concentrated. After the tissue has undergone necrosis you cannot absorb quinine. It remains there, and it has been cut out twelve months after it has been injected. Therefore, I don't think there is any place for its use hypodermically.

Dr. B. H. Booth, Drew, Miss. (closing the discussion)—With all due respect to what Dr. Bass has said, I submit that the proof of the pudding is in the eating, and clinical experience has demonstrated the fact time and time again that you can take cases of pernicious malaria and give quinine in capsules and in powder form, and follow it with some acid and you will not get the therapeutic effect of the quinine, and the patient will die. In at least 95 per cent of the cases, if you will give plenty of quinine hypodermically, you will have a well patient, and that is what we are after and not theory. You can take the authorities and quote from them who have been in tropical countries, and you will find they disagree with Dr. Bass very materially even as to the amount of quinine that should be given. One authority in Cuba in cases of pernicious malaria has given as much as twenty grains hypodermically with the happiest results. As Dr. Bass says, it may be a fact that quinine does cause some necrosis when injected under the tissues; but in the section of country I come from we have pernicious malaria and if something is not done for these children they are going to die in a few hours. You cannot wait to get the effects of the quinine whenever you give it by mouth, because it takes several hours, and it does not take several hours if you give it intramuscularly or intravenously. If you give it by the mouth the patient will be dead, and if you give it by a hypodermic syringe by the time you are looking for therapeutic results the patient will be well.

In regard to the questions asked as to the amount of quinine used, without regard to the authorities, from clinical experience I have found that these little patients bear relatively large doses of quinine, and as a rule we give one injection every 24 hours of 7 1-2 to 10 grains, and I have never yet had one of these little patients

die from a hypodermic injection of quinine. I have had them die where I attempted to give it by the mouth and by inunction or by any other methods except hypodermically. They have not died when the quinine has been administered in that way.

In answer to the question relative to the apparent leucocytosis, if you consider the time of the year and the fact that we have no symptoms of any trouble in the lung, that sign would be almost pathognomonic.

SOME FACTORS IN THE PREVENTION OF MALARIA.

By WILLIAM H. DEADERICK, M.D.,
Hot Springs, Ark.

THE MILLS-REINCKE PHENOMENON AND HAZEN'S THEOREM.

Shortly after a filtered and purified water supply was installed in Lawrence in 1893, Mr. Hiram F. Mills, of the Massachusetts State Board of Health, observed that there was a decided decrease not only in the number of deaths from typhoid fever but from other diseases as well. Almost simultaneously Dr. J. J. Reincke, Health Officer of Hamburg, noted a similar result on the death rate of that city, following an improvement in its water supply.

Based on the experience of these observers and his own observations in Albany and Troy, Hazen in 1904 evolved the following theorem: "Where one death from typhoid fever has been avoided from the use of better water, a certain number of deaths, probably two or three, from other causes, have been avoided."

The deaths from diseases other than typhoid which have been prevented by improvement of the water supply are diarrhoea, cholera infantum, and other gastro-intestinal diseases, pneumonia, pulmonary tuberculosis, and bronchitis. Aside from the reduction of the death rate from typhoid and other diseases there has been a perceptible improvement in the general health of the community.

I venture the postulate that *if through drainage one case of malaria is prevented at least one case of sickness from other cause is prevented.*

Diseases other than malaria which we might hope to influence through drainage are:

1. Those conveyed through contamination of drinking water:
   a. Typhoid fever.
   b. Enteritis.
   c. Cholera.
   d. Intestinal parasites, etc.
2. Those conveyed through soil pollution favored by soil moisture.
   a. Typhoid fever.
   b. Hookworm disease.
3. Those conveyed by aquatic bred insects:
   a. Yellow fever.
   b. Dengue.
   c. Filariasis.

RESIDUAL AND COMPLEMENTAL MALARIA.

It is the duty of every community to furnish its citizens with a wholesome water supply. Typhoid fever which is eliminated through purification of the public water supply is known as "water-borne" typhoid, and that which remains is called "residual" typhoid.

It is likewise the duty of the community to destroy at least those breeding pools which through the production of anopheline mosquitoes endanger the health of the neighborhood and not merely the occupants of the premises. This should be regarded as a minimum essential. After such destruction the malaria which remains and concerns chiefly the occupants of the infested premises may be regarded as residual malaria. The malaria which has been eliminated in reducing the rate to the residual may be termed "complemental" malaria. It follows that complemental malaria is a community problem and that residual malaria is largely an individual problem.

CHOICE OF METHOD.

If there is anything demonstrable by results of past experience in the prevention of malaria it is that no one method of prophy-

laxis is universally applicable. In prophylaxis as well as in therapeutics the remedy must be adapted to particular indications and the vaunting of a universal method is on a par with prescribing a nostrum as a cure-all.

In the Canal Zone, Havana, and India, mosquito prophylaxis has been relied upon chiefly; in Italy, quinine; at Ismailia, both mosquito destruction and quinine; at Klang and Port Swettenham, mosquito destruction alone, and in a recent campaign in California, mosquito destruction and *education.*

A belief in the possibility of complete eradication of malaria is not visionary provided it is not to be attempted by any single method alone. A one method campaign over an extensive territory would in most instances result in a reduction to an irreducible minimum more or less remote from complete eradication. The analogy between the complete eradication of malaria and of yellow fever fails in two important particulars: First, the popular dread of yellow fever which unites the public to co-operate with the health authorities; secondly, in yellow fever there is no carrier problem, which is big in malaria.

The prophylactic measure best suited to a particular locality depends largely upon whether the problem is essentially a community problem or an amalgamation of individual problems; whether it is a problem of complemental or of residual malaria; or, in other words, whether a few breeding pools are responsible for the malaria of the entire locality or whether each householder is breeding his own stock of anopheles which infect his household only. Much of this finally rests upon density of population. It further obtains that possibility of radical destruction of breeding pools is usually in direct ratio to density of population.

Universal quinine prophylaxis is impossible to enforce. Discriminative quinine prophylaxis, considering only cases and carriers, is almost as difficult for these reasons:

1. Many cases are not seen by physicians.
2. Radical cures are not effected.
3. Carriers are difficult to determine.
4. Carriers are difficult to sterilize.

Even if every parasite in the United States were destroyed and no attention were paid to mosquitoes every imported case of malaria or malaria carrier would rekindle the endemic and the campaign would have to be repeated.

Quinine prevents only one disease, has no collateral benefits, and has even been suspected of producing quinine resisting forms (*chininfasten malariaparasiten*).

That there is an irreducible minimum consequent upon quinine prophylaxis alone is demonstrated by the experience in Italy where this method has been tried more thoroughly than in any other country and much more thoroughly than could, for social reasons, be hoped for in the United States. The following table from Celli (Proceedings of the Third Meeting of the General Malaria Committee Held at Madras, Nov. 18-20, 1912, Simla, 1913), demonstrates this and shows that during the last three years covered by the report the disease has actually increased.

STATE QUININE AND MORTALITY FROM MALARIA IN ITALY.

Financial Year.	Kilograms Sold.	Calendar Year.	Mortality from Malaria.
		1900	15,865
		1901	13,358
1902-03	2,242	1902	9,908
1903-04	7,234	1903	8,513
1904-05	14,071	1904	8,501
1905-06	18,712	1905	7,838
1906-07	20,723	1906	4,871
1907-08	24,351	1907	4,160
1908-09	23,635	1908	3,463
1909-10	21,656	1909	3,533
1910-11	22,795	1910	3,619

Celli (loc. cit.) pessimistically concludes: "No remedy, therefore, quinine not excepted, is always effective in enabling us to eradicate malarial infection at will; and so not even with the most accurate inter-epidemic and pre-epidemic treatment—much less with the kind of sanatorium that gathers in little carriers of plasmodia without the means of curing them all permanently and effectively—can we believe it possible for malaria to be exterminated (*hoc opus, hic labor est*) in an extensive locality already overrun by the disease."

The far-reaching results of unconscious prophylaxis, the unintentional elimination of malaria from former hotbeds of the disease, have been accomplished largely through abolition of breeding pools in the march of civilization.

Mosquito prophylaxis is radical; the mosquito is the definitive host of the parasite.

It is easier to locate breeding pools than malaria carriers; it is easier to abolish breeding pools than to educate the profession and the public to the importance of radical cures.

Besides the prevention of malaria, drainage posseses three collateral benefits.

1. Prevention of other diseases.
2. Riddance of disagreeable pests.
3. Reclamation of land.

If it is feasible to eradicate malaria by the destruction of mosquito pools, this is certainly the method of choice. Why live in a locality which necessitates the systematic use of a drug when that locality can be rendered thoroughly sanitary?

It is usually possible, especially in densely populated communities, to eradicate complemental malaria radically by attacking the anopheles. Drainage is therefore particularly a community problem. Where the problem is an individual one or an amalgamation of individual problems and destruction of breeding places is impossible, quinine, screens and oil must be relied upon. It is not infrequently the case that residual malaria can be completely eliminated by simple and easy measures directed toward the abolition of pools.

Even after the community has furnished a pure water supply, circumstances may arise when it becomes advisable for the individual to be vaccinated against typhoid fever. Similarly after a locality has eliminated complemental malaria quinine may have a role. Its value will be in inverse ratio to the density of population.

There is one mighty weapon in the campaign against malaria which has been all but neglected in past campaigns, excepting a recent one in California, and that is education. The public should be made familiar with the etiology of the disease, practical preventive measures, and especially with the public health significance of the latent or carrier stage. It cannot be denied that many adult inhabitants of malarial sections of this country could not be educated up to practical malaria prophylaxis even with concentrated effort throughout a long life time, but by devoting careful attention to their children and to their children's children a generation of malaria fighters would be bred.

QUININE-FAST MALARIAL PARASITES; A MEMORANDUM.

By H. R. CARTER, M.D.,
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Without going into the subject of malarial relapses, which is a very big one, this much seems true.

When a man is suffering from a malarial infection which from time to time develops into malarial fever, the parasites must exist in him during the interval between the attacks al though not in sufficient numbers, or in such a form as to produce an attack of fever. When enough asexual forms are produced from them to provoke systemic reaction, the relapse is produced. During the interval there seems no evidence that they, the parasites, exist in any other form than as we usually know them, or in any other tissue except the hematocytes, although, of course, both are possibilities. The increase of asexual forms should come, then, from the proliferation of the parasites in the ordinary way, and the daughter-parasites should, more or less, partake of the characteristics, original and acquired, of those from which they spring.

In relapsing malaria quinine may be given during the attack sufficient to cure it and to destroy the greater part of the asexual parasites, so that there are not enough left to keep

up the attack; it may be given between the attacks in the same doses, and continued some time without preventing the relapse—that is, without killing all the parasites, enough escaping to proliferate later and produce the relapse with an abundance of asexal forms in the cutaneous circulation. The bulk, the great bulk, of the parasites in such relapses are destroyed by ordinary full doses of quinine, but a small number (too small to produce malarial fever and generally too small for asexual forms to be found in the blood), are not killed by them. These are the so-called "quinine-fast" parasites.

There are two hypotheses allowable:

1. The parasites that survive are less susceptible than normal to that action or quinine.

2. They are less accessible to it than normal.

Under the first would be included the doctrines of a resting stage in which the parasite is more resistant to injurious influences. dinn Bignani; Craig.)

Unless we accept these there seems to be some reason for believing the second hypothesis the more probable:

First. Old relapsing cases of malarial infec- (Schaudinn Bignani; Craig.)
quinine, are especially prone to show the "quinine-fast" parasites. It seems improbable that they, the parasites, should become insusceptible to quinine simply by long residence in the human body, while this long residence would be the condition most likely to allow the parasite to establish itself in every part of the human body, some of which must be less accessible to quinine than others.

Second. If the relapses, in spite of quinine, are caused by parasites insusceptible to quinine remaining through its administration and then proliferating until they reach a sufficient number to cause the attack, it would seem that the parasites resulting from the proliferation of these insusceptible ones would be less susceptible than normal, and increasingly so in every relapse when the preceding attack was treated with quinine. On the contrary, the relapse many times repeated yields as readily to quinine as the primary attack, probably rather more so.

Possibly the analogy of some other infections caused by animal parasites might be quoted, as syphilis, but they are quite different from malaria in that the parasites are not confined to the blood, and the analogy would be fallacious.

This hypothesis is entirely in accordance with the fact that quinine in large doses and long continued may be efficient against these residual "quinine-fast" parasites.

It is not pretended that parasites have been found during the interval between relapses in situations specially difficult of access to quinine. This hypothesis is merely suggested as having some probability.

A DISCUSSION OF SOME OF THE NERVOUS DISEASES OF INFANCY*.

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In infancy we have certain distinctive peculiarities of the nervous system which we must appreciate before we can understand the disease. The brain and cord, like the rest of the infant's body, are immature and in a preparatory condition. The brain is extremely large in proportion to body weight, containing a large per cent of water. In consistency, soft and pultaceous—its gray and white substances differ but little in color and composition. The same may be said of the cord. The anterior horns are predominant and hence more frequently the seat of disease, as acute polio-myelitis.

The peripheral nerves are at first relatively large, but in the first few days show but little excitability. As time passes on this excitability increases out of proportion to the development of the cord, hence the various reflex manifestations as convulsions, etc., as the

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result of this lack of inhibition. For a short time after birth the conducting fibers between the undeveloped brain and the pyramidal fibers of the cord are without functions. This explains why the first movements of the new-born are subject alone to reflex excitability, not at all controlled by will power, hence the most rigid and careful directions should be given nurses and mothers as to absolute quiet and care in the handling of the new-born. For here you can somewhat determine and shape the future nervous state of the infant and child.

After the first month or two the brain develops very rapidly, but never uniformly. Just here let me urge upon you as physicians not only to study this matter of uniform brain development of the infant, but help the parents by calling their attention to the needs and necessities of the training of the central nervous system of the young. Such works as "The Training of the Central Nervous System of the Young" could be put in the hands of any intelligent parent with great benefit to posterity.

Not only do infants present peculiar characteristics of the nervous system, from an anatomical and physiological standpoint, but the clinical syndrome for diagnosis is essentially different, consequently in all the maladies of infants, both of the nervous system and the general system, difficulties of determining the diagnosis are greater than in adults.

Infants are not merely little men and little women in whose bodies disease manifests itself by the same tokens as in adults. They express themselves like the untutored savage, by groans, cries and gestures which require experience to interpret, and tact and skill to develop. Take, for example, those diseases due alone to a disturbance of the reflex centers (this reflex irritability continuing for some two years of the infant's life). Such diseases as:

1. Convulsions and coma from over-feeding, that picture so often seen, skin hot, temperature high, extreme agitation, physical and motor disturbances, convulsions and coma, nocturnal delirium, etc.

2. Brain symptoms; headache, vertigo, delirium, squint, even opisthotonos, without intra-cranial trouble.

3. Reflex convulsions from skin irritation.

4. Nervous shocks in diarrhea, dysentery, toxic shocks. All these are but the daily manifestations of the instability of the nervous system.

The acute convulsions of infancy are acute symptomatic phenomena and, occurring as four-fifths do, within the first or second year of life, causing us no little worry and thought. A convulsion is really only a symptom, but a symptom of such prominence that it overshadows the cause or perhaps an organic lesion.

The various forms of infantile convulsions are embraced:

1. Simple reflex convulsions.

2. Larynxgeal spasms (Laryngismus Stridulus), a peculiar convulsive seizure, having its origin almost entirely in a rhachitic condition.

3. Tetanus Neonatorum, the tetanus of the new born, occuring within the fourth to tenth day of birth. Except at this age tetanus is rare before the fifth year.

4. Tetany; that intermittent or persistent tonic spasm of groups of muscles of the upper or lower extremities, occurring most commonly from the fourth to the twentieth month; here, too, we find rickets playing a major etiological role—at least 65 per cent found to be rachitic.

5. As for epilepsy, hysteria and chorea—these are diseases of childhood and not infancy. While cases of each of these have been reported in the early months of infancy, they are so rare that we can almost claim immunity, although I have seen hysteria in infants.

Now, as to the organic diseases of the nervous system as found in infants:

1. The Obstetrical Palsies.—These palsies are traumatic in character, due to manipulation

or pressure during labor. They may be either peripheral or central—either a neuritis or cerebral trauma. The diagnosis is always to be made between the peripheral palsies and the cerebral birth palsies.

This is very excellently drawn by Sachs in his "Diseases of Nervous System of Children."

OBSTETRICAL PALSIES OF BRACHIAL PLEXUS.

1. Arm only affected.
2. Flaccid paralysis with atrophy.
3. Deep reflexes absent, surely not exaggerated.
4. Changes in reaction from simple loss of faradic response to reaction of degeneration.
5. No convulsions.
6. Deformity and arrest of growth of entire extremity.
7. Sensation may be impaired.

CEREBRAL BIRTH PALSIES.

1. Hemiplegia or common brachial monoplegia.
2. Spastic paralysis, with or without atrophy, with tendency to rigidity.
3. Deep reflexes increased.
4. No changes in electrical reaction.
5. Convulsions apt to occur and to be repeated.
6. Flexion contractions of fingers, wrist and elbow.
7. Sensation not affected.

DISEASES OF THE BRAIN.

Meningitis.

1. The most common diseases of the brain in infants are the various forms of meningitis occurring after many of the infectious diseases, pneumonia, diphtheria, erysipelas, traumatic nephritis, etc. My experience has been that I have most frequently seen it follow in infants the diseases of measles and pneumonia and diphtheria.

2. Tubercular meningitis; by far the most common form of meningitis in infants, while comparatively common after six months to four years.

Discuss forms of tuberculosis in children. While this type of tubercular trouble may, and not infrequently does, occur in healthy children, yet in the majority of instances the children are rather weak and feeble, with little resistive power. In contradistinction to other forms of meningitis which come on acutely, and with pronounced symptoms, these cases come on very insidiously and in the early stages the difficulty of making a positive diagnosis is almost insurmountable. Most cases in the early stages are diagnosed as some continued fever, particularly typhoid.

Of course, the antecedent history of the child and its environments are very important factors in making up our diagnosis. The general symptoms in the later stages resemble so closely the slight disturbances from reflex irritation, toxaemia, etc., and many other forms of infections. Sympathetic brain symptoms from the irritation and inflammation in the ears and many other conditions cause symptoms so closely resembling the early symptoms of tubercular meningitis that we are at sea in the great majority of cases, in so far as our ability to make a positive diagnosis is concerned, consequently I would urge upon you the necessity of giving a rather guarded diagnosis as well as prognosis.

Many of the simpler forms of meningitis recover, but tubercular meningitis never.

I have in several cases found it necessary after the recovery of the child to back down from my diagnosis. The most trustworthy symptoms are based upon that of the basilar symptoms, for it is at the base of the brain that we find the greatest disturbances, and until these basilar symptoms appear it is well nigh impossible to make a positive diagnosis.

3. Epidemic cerebro-spinal meningitis.

While this type of meningitis attacks all ages, it is unquestionably very common in infants, possibly 30 per cent occurring in the young under two years of age.

II. HYDROCEPHALUS.

Not an uncommon trouble in infants; it may be primary or secondary or according to the location of the fluid. Internal, when the

increase is in the sub-dural spaces. For clinical convenience we classify them as follows:

1. Acute hydrocephalus (tubercular meningitis).

2. Chronic hydrocephalus.

3. Congenital hydrocephalus (always chronic).

1. Acute-primary or secondary (discuss former classification of acute hydrocephalus as tubercular meningitis). Oftentimes secondary to acute diseases, may be idiopathic (onset sudden, occasionally insidious) headache, rigidity of neck, nausea, vomiting, delirium, pupils sluggish and often unequal; optic neuritis often present. Paralysis of the external rectus is frequently seen. This condition is rare before the first year and most common between the first and fifth years.

2. Chronic hydrocephalus. The accumulation of fluid in these cases generally begins in utero, although in speaking of chronic hydrocephalus we generally refer to the primary type as coming on after birth, although it may be large enough at birth to obstruct delivery. The reasons and causes for these conditions are practically unknown, while alcoholism, syphilis and tuberculosis of the parents are predisposing causes; but infants affected thus may be born of healthy parents.

The quantity of fluid accumulated in the ventricles varies greatly. It may be only sufficient to separate the cranial bones and show a slight spherical enlargement up to enormous size as high as ten to twenty-five pounds weight of the head, the gray matter being the only cerebral substance left so thin and stretched that it is only a slight fraction of an inch in thickness; convolutions entirely obliterated, and to me it has been a wonderful surprise to see how much intelligence many of these extreme cases of chronic hydrocephalus display. I have in mind four cases, two under twelve years of age, and two ranging from twenty to forty years of age, with heads that will measure three feet around, yet they display a great deal of intelligence. On the other hand we find with this increase in size of the head oftentimes the development of idiocy and paralysis.

3. Congenital hydrocephalus: We should make no distinction between this and the variety just preceding. If the enormous size of the head is shown at birth, we call it congenital, but still chronic. The same etiology and same symptomatology in both cases. The exact form of hydrocephalus, whether it be congenital or acquired, can be diagnosticated only with reference to the history of the individual.

III. INFANTILE CEREBRAL PALSIES.

These are classified as a rule in three varieties:

1. The intra-uterine or prenatal; those that occur in utero from indefinite causal influences. Such influences as maternal impressions, fright, hereditary insanity or neurotic affections; an injury or blow to the abdomen; exhausting fevers during pregnancy; syphilis and possibly alcoholism.

2. The birth palsies. These are conditions caused by traumatism during labor, hemorrhages on the surface of the brain or within the brain tissue from traumatism or instruments. When we consider the amount of traumatism done a child's head in both normal and continued labor it is surprising that this result is not more common.

3. The post-natal cases. These are the cases that follow most frequently the acute infectious diseases, measles, scarlet fever, pneumonia, typhoid fever, cerebrospinal meningitis, etc. I have seen a number of these cases result from hemorrhages during severe paroxysms of coughing in whooping cough. We see many of these forms of palsies also occurring from all forms of meningitis. They are the complications we fear in meningitis. Strumpfell also offers the theory that many of these cases are encephalitis, very similar in its pathology to infantile poliomyelitis.

4. Then come the various forms of tumors of the brain, affecting meninges of infants, tuberculosis, of course, being the most common, and syphilis the next. Cerebral tumors are by

far the most common in infants. The base of the brain seems to be the point of least resistance.

5. There are also to be considered various forms of distrophies of the brain of infants, those usually due to the defective development, from monstrosities to slight defects.

DISEASES OF THE SPINAL CORD.

1. Anaemia and hyperaemia of the cord: These are two conditions of the cord of infants problematic. While we have congestions of the cord just as we have the same conditions of the brain, we use the terms largely to cover our ignorance of the true pathological condition. It is impossible to differentiate these conditions from other states, as they occur in every disease of the cord, and it is impossible to discuss them as a separate clinical phenomenon.

2. Infantile spinal paralysis: Of all the cord diseases in children, this is by far the most common and few diseases present as many interesting problems as that of the acute anterior poliomyelitis. While the etiology of the disease was somewhat uncertain until a few years ago, it was even then the accepted view, and really the only satisfactory explanation, to suppose that the inflammation of anterior cornua of the cord is the result of some acute infection, occurring as it does ordinarily about the second summer, and when gastro-intestinal troubles are rife; and taking into consideration the fact that other acute infections show a predilection for certain sites in the body, certain points being most vulnerable to the various epidemics. We now know that it is a specific infection and due to a specific germ which has possibly recently been isolated.

Etiology.—We find that possibly four-fifths of all sporadic cases of infantile paralysis come on between the months of June and September, and that the great majority of this 80 per cent occur during the latter part of July, August and the first of September; they occur generally in the summer months, when the child's vitality is lowered by the intense heat and its nutrition is impaired by gastro-intestinal disorders so frequent at this season, while improper clothing, sudden exposure to cold and sudden chilling of the surface of the body may be factors in predisposing to this condition.

I would wish that the scope of this paper allowed me to discuss at length the various types of poliomyelitis with their varied symptoms and diagnosis. I have seen almost all types of the disease in infants from the severe forms affecting the cervical cornea with sudden death from respiratory failure; the cases of complete and permanent paraplegia or multiplegia, down to monoplegia or even permanent paralysis and atrophy of single muscles.

Acute and chronic myelitis. While mistakes of diagnosis are frequently made and these terms, acute and chronic myelitis, oftentimes are used to cover our ignorance, yet they do occur occasionally in infants. The more or less acute onset, the sudden loss of power, and the rapid appearance of anaesthesias; the retention of urine and feces with flaccid atrophic symptoms below the injury, but with spastic symptoms coming on, leave little doubt of diagnosis of acute myelitis. The difference between cord meningitis and myelitis is not of very great clinic importance because we have neither condition present without more or less of the other.

Syphilis of the spinal cord (specific myelitis and meningomyelitis). This is only a name used to describe the cause of the conditions.

Disseminated sclerosis. Diseases of this character are practically unknown in infants.

Compression diseases of the spinal cord. These are the diseases that occur from direct pressure upon the cord, particularly seen in "Potts' Disease." For the diagnosis of these cases we depend upon the location and the extent of the trouble.

Hereditary diseases of the cord: Hereditary ataxia, Friedreich's ataxia. This comparatively rare condition may come on very early in life and may show great progress dur-

ing the period of infancy. I have been fortunate enough to see two cases of Friedreich's ataxia within the past two years.

Pseudo-hypertrophic muscular paralysis may occur about the time the infant begins to walk; ordinarily, however, the symptoms do not appear until the fourth or fifth year.

The various birth distrophies, namely, meningocele, spina bifida, etc. These are practically rare conditions and may occur at any time under any conditions.

The factor of interest in a paper of this character would be the differential diagnosis between spinal and cerebral palsies.

Differential Diagnosis.—Let me state in a few words the differential diagnosis between the cerebral paralyses and the spinal paralysis of childhood, particularly acute anterior poliomyelitis. We find the cerebral palsies generally affecting one side, giving us hemiplegia. It is true that we have this variety of paralysis in poliomyelitis, but the most common form is monoplegia or paraplegia. We have in all cases of cerebral paralysis, whether in children or adults, a certain amount of spastic rigidity of the muscles. In infantile paralysis we have a flaccid condition of the muscles. Then, too, with the spastic rigidity of the muscles you would naturally expect a restrained or spastic gait, in contradistinction to the flaccid gait which is seen in poliomyelitis. In cerebral paralysis the whole limb, all the muscles and all groups of muscles of the limb are affected; whereas in poliomyelitis, as far as the ultimate effect is concerned, we find only certain muscles or groups of muscles affected, *i. e.*, the extensors, adductors and supinators. It may be one muscle or one group; it may be one supinator or it may be all; it may involve one extensor or many of them; there may be a localized degeneration if you choose to call it so. In cerebral paralysis we have contraction of all the muscles affected eventually, especially the flexors and adductors; whereas the only contractions occurring in poliomyelitis are in the flexors of the calf, when, the gastrocnemius not being affected, you have produced another form of equinus. As to spasmodic movements in the two conditions, in cerebral paralysis we may have postparalytic chorea, following hemorrhage into the brain or meninges. Epileptic convulsions are not uncommon in cerebral paralysis, whereas in poliomyelitis the only convulsions that occur are in the beginning of the attack, just as we have initial chill in other conditions. Sensation is unaffected in both diseases.

In cerebral paralysis we have simply an arrest of growth and no impairment of the nutrition of the part other than the impairment that results from non-use; in poliomyelitis there is a tendency to extreme atrophy, extreme interference with nutrition, coming on early in the paralyzed limb and extending until the muscle of the limb become simply shreds in some cases, the muscular fibers being almost entirely replaced by fatty fibers, leaving the muscles completely atrophied and practically destroyed.

In cerebral paralysis we have normal electrical reaction, whereas in the paralysis of anterior poliomyelitis we find the reaction of degeneration, which is positive proof of anterior poliomyelitis if it is properly applied; but it is a method of examination that is oftentimes a failure in children if not properly used. The patellar tendon-reflexes are exaggerated in cerebral paralysis, whereas in poliomyelitis, when the anterior tibial group or the quadriceps extensor muscles are involved, you have an absence of the tendon reflexes in the affected limb. In the majority of cases of cerebral paralysis we find the speech is more or less impaired, whereas in poliomyelitis there is no impairment of speech. In cerebral paralysis, as a rule, the intelligence is impaired, whereas in poliomyelitis intelligence is normal.

In this rather rambling paper it has been my purpose to run over the various nervous diseases we find occurring in infants, that period, the very beginning of human life, embraced within the first three years. It is not so easy a matter to diagnose truly the diseases in childhod as in adult life, and from the fact

that so many physicians treat the diseases of infants only in a symptomatic way, it occurred to me that a consideration of this subject in its entirety might not only be interesting but profitable. It would be impossible for me to bring anything new, that was worth the while, but by a composite review I trust I have given at least some of you food for thought and consideration.

VASCULAR HYPERTENSION AND ASSOCIATED NERVOUS SYMPTOMS.*

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So many cases of organic and functional nervous disease have been shown in this clinic that it has been decided today to vary the routine and discuss not a disease, but a symptom of disease only. This is an unusual procedure, but the distinction which has of late been accorded this symptom, namely, vascular hypertension, both in the literature and in contemporary practice, and the frequency of its occurrence in nervous diseases, seem to merit this attention on our part. In fact, many of us have apparently treated this symptom as a disease *per se*, and regardless of its significance, have, in our ill-advised enthusiasm, endeavored to control it immediately in every patient at any cost.

This is but another illustration of that faddism which occasionally dominates medical and surgical practice, and leads us to speed our special "favorites" at a fast and furious pace.

Fortunately for our patients, the race has been about run, and it now behooves us to survey calmly the field and estimate correctly the results obtained.

Vascular hypertension is a frequent symptom of disease, as you have seen many times in this clinic, but I believe that its presence and significance have often been much overrated and magnified, and that too much importance has been attached to it, and too energetic efforts used to combat and control it.

Its discovery, if I may so term it, is a most interesting by-product of the use of the clinical sphygmomanometer, and like most new discoveries, it has taken time for a proper estimation of its meaning. Its recognition, and early recognition, is of the greatest value in enabling us to institute preventive measures by which to control it and combat its later effects, but when discovered, we must not allow the magnitude of this one symptom to engross our therapeutic attention to the exclusion of some underlying morbid process which, though obscured at the time, may be the sole cause of the symptom that is so prominent, and apparently so pernicious.

Consequently, it is our manifest duty to examine thoroughly every patient offering for treatment, and if this symptom of hypertension presents itself, endeavor to ascertain its genesis and significance. It is a symptom which may be present in many different diseases, but most often attention to its presence is attracted by the associated nervous symptoms which distress the patient. Speaking broadly, these may be classed under two general heads, namely, those of a congestive and those of a depressive type. I am exhibiting to you now two illustrative cases, the one with a persistent average systolic hypertension of about 200 mm. Hg, and a diastolic pressure of about 125 mm. Hg., with a congested face, full and rapid pulse, frequent vertigo, some dyspnoea at times, and intermittent headache; the other with a confirmed systolic blood pressure of about 165 mm. Hg. and manifesting an entirely different set of symptoms, which, in the main, are indicative of a pronounced mental depression and psychic debility.

These two cases illustrate what has already been said as to the importance, also, of prop-

*Clinical lecture delivered in Memorial Hospital Amphitheater February 28, 1914.

erly accounting for this symptom, for the first case has been found, after a careful study of all its clinical features, to be due to a remote syphilitic infection, while the other is supposed to be due to the presence of an irritating uratic calculus, discovered in the left ureter by means of the cystoscope.

While both of them have a persistent vascular hypertension, and have marked nervous symptoms, yet neither of them are nervous diseases, nor likewise will they respond to the usual therapeutic measures directed to the immediate and direct control of the hypertension, for the basic cause of this symptom in each case is much more intangible and difficult of removal.

Hypertension is in a sense a relative term, and while a definite standard may be assumed as normal for individuals in perfect health, yet it is a nice question in many cases to decide under certain existing conditions, whether the tension in the given case above the normal limit for that age, is as ominous as it may appear, and should be controlled at all hazards.

From my experience, I should unhesitatingly say that in the study, as well as in the practice, *individualization* in these cases must be the rule, for in no other way can any measure of precision in treatment be secured.

The mere existence of this condition must always cause anxiety, for if too little is done, a possible catastrophe through the rupture of a weak blood vessel is possible, or if too much is done, we are confronted with the possibility of weakening the circulatory force, and thus inviting another danger, but late investigations have proved conclusively that high blood pressure is primarily compensatory, and it is left to us, after a most thorough study of each individual case, to determine for that case, the true meaning and status of such a condition of super-normal tension.

For some years after the introduction of the sphygmomanometer and the consequent normal blood pressure standards that were agreed upon, I valiantly attacked every super-normal tension that I encountered, and really believed that this was vitally imperative, if any should by chance reach such a limit as even 160 mm. Hg. for any age, but my super-scientific ardor has of late waned, especially since, when I had time to study my tabulated results, I found that many of my cases of hypertension could not be reduced below a certain figure (which by the books was still notably excessive) and that still others did not die, which by all scientific rules then promulgated, they should have accommodatingly done! Neither did I know, then, as I believe now, that there may be in some rare cases vascular crises incident to generalized intermittent claudication, that are incapable of remedy or relief.

In the light of recent experience, it is necessary, then, that we readjust our former views, and in every case take a most careful history, and at the same time make a most complete investigation of the cardio-vascular-renal and alimentary systems, so as to determine the cause of the hypertension, if it be present.

In addition to this examination for organic lesions, we must consider fully in each case the personal equation as to syphilis, lead, gout, rheumatism and malaria, and also note carefully the life and habits of the individual as to "overwork and overworry, especially in combination with overeating, under-exercising and under-sleeping, plus the possible influence of alcohol and tobacco," for these conditions themselves, independent of organic causes, may bring about in at present some unknown way an intravascular, intracerebral and intraspinal hypertension that will later eventuate in an arterio-sclerosis of all the organs.

It is entirely obvious, then, that the all-important thing is not only to recognize this condition when it is present, but to value it only according to its particular significance in the special case under consideration.

Fortunately, clinical research has demonstrated a physical as well as a therapeutic test, both of which are of service in determining whether the pressure is confirmed or recent, as follows: If the left ventricle is hypertro-

phied, it is almost proof positive that the pressure has been persistently high for months or years, but if the restriction, or temporary omission of red meats and alcoholic drinks from the dietary of those who use them freely, diminishes the pressure notably, the inference is that the condition is recent and probably of a toxic origin, and that it is of more favorable prognosis as to control. It is now believed that in many cases the increase in blood pressure is gradual, and that the individual readjusts his cardio-vascular mechanism to compensate this, and consequently that to arbitrarily set up a physiological standard for the normal systolic pressure, as formerly, of 110 to 140 mm. Hg. for ages from 18 to 40, and 140 to 165 mm. Hg. for ages from 40 to 70, and to reduce in all cases the existent pressure to this fixed physiological limit is not only not indicated nor justified, but is harmful therapy, for the hypertension, even at 200 mm. or more, in some cases, is the result of pathological causes and conditions which cannot be remedied nor removed, and the existing hypertension must be accepted as a compensatory effort on nature's part to supply sufficient blood to certain damaged vital organs, and as one of her natural defenses.

Dr. Piersol says that "in the two most important conditions associated with hypertension, chronic nephritis and arterio-sclerosis, it has been shown that in the former the high blood pressure is essential in order to maintain adequate elimination through the damaged kidneys, and in arterio-sclerosis the elevated pressure helps increase the circulation in organs whose nutrition is impaired because of their diminished blood supply."

These attempts on the part of nature to balance the organism, if the underlying cause be only irritant in character, may produce only an arterio-spasm and be easily remedied, but if more fundamental degenerative changes have taken place in the vessel walls, more serious damage in all of the organs may occur, and a blood pressure which was primarily compensatory, may become persistent and pernicious.

Theoretically, the prevention of this tendency would appear easy, but practically it is most difficult. Nevertheless, since this condition results principally from lesions in the kidneys or blood-vessels, the treatment of vascular hypertension should be directed to prophylaxis of these conditions, and if this is impossible, to the management of the hypertension when once developed because of them. The prophylaxis of high blood pressure is most important, and calls, therefore, for the early recognition of the conditions and causes which tend to produce kidney disease and arterio-sclerosis, so that these diseases may be treated in time to prevent grave secondary changes, after which therapy of any kind is of little avail.

No one can know definitely a given individual's capacity to withstand a specified hypertension, but clinical experience has demonstrated that a persistent excess of vascular tension above a well defined point in the average patient is dangerous. The existing tension, however, cannot be treated unless it is first ascertained by the routine examination of every patient, no matter what the supposed disease may be, but fortunately this is as easy in practice as it is rational in theory, for today the sphygomomanometer is, or should be, within reach and one of the routine procedures of every practitioner. With it as a guide for the estimation of both systolic and diastolic blood pressure, few cases of nephritis or arterio-sclerosis, even in their early manifestations, would be overlooked or undiscovered, and its routine use in every case would detect the danger signals which nature is flying, in time to abort or modify them.

In fact, the importance of this routine blood pressure determination cannot be too strongly emphasized, for this in my experience is the only time when our therapeutic efforts will be rewarded, but unfortunately it is the very time

when the fewest cases are discovered or treated.

When vessel spasm alone is present, the outlook is hopeful and encouraging, and every effort should be made to institute such treatment as will prevent the occurrence of organic changes.

The management of high-blood pressure cases may be considered under two heads: Developing Hypertension and Confirmed Hypertension.

Developing Hypertension. The treatment of this condition is apparently simple in technic, but practically very difficult in application. It requires but few drugs, and yet much patience and perseverance on the part of the physician, as well as an enthusiastic and sustained co-operation on the part of the patient. In a word, it is largely protective and hygienic, and demands, *first,* a thorough understanding by the patient of his condition; *second,* the restriction of red meats and alcoholic drinks, as well as other cardiac excitants such as coffee, tea and tobacco from the dietary of those who take them freely, the intake of nitrogenous foods being lessened, as well as to the total bulk of food reduced; *third,* the output of waste products should be promoted by all excretory channels such as the bowels, kidneys and skin; *fourth,* exercise, which should be graduated to the needs of each case; *fifth,* overwork and mental stress should be regulated and enforced; *sixth,* rest at stated periods, free from all irritations and interruptions; *seventh,* the removal of any source of local infection, if such be present, and *eighth,* the submission of the patient at stated intervals for physical examinations and blood-pressure readings.

These requirements need not, in this presence, be discussed in detail, but their correct enforcement spells success or defeat in the management of every case of developing tension. If, after their thorough application for at least one month, the tension still persists as super-normal, the case may be considered as one of confirmed high tension, and its underlying morbid source should be further studied and treated.

Confirmed Hypertension. The conditions which make for a developing hypertension will, of course, if unchecked, cause a confirmed vascular hypertension, and the management of these latter cases, especially when dependent upon some well-defined, irremedial anatomical change in the organism, is both difficult and unsatisfactory. In this class of cases, as in those of the developmental type, the characteristic and dominant lesion is renal or vascular, as the underlying cause is usually toxic.

Consequently, to benefit them, we must aid nature to sustain the proper compensatory hypertension, by decreasing the production of the toxic agent only to a point where its effects shall not be increasingly destructive and degenerative. This is best accomplished by the following measures:

(1) *Drugs.* While the range of medicinal means is a limited one in the treatment, yet there are certain indications which can be met only by suitable drug medication. In the first place, mild aperients, which give at least two daily actions of the bowels without straining, are of extreme importance. The best of these is liquid albolene or pure paraffin in tablespoonful doses night or morning, or both, alternating in some patients with a medium dose of some one of the mineral waters, given hot every second or third morning.

Frequently, one to two grains of calomel, or five to ten grains of blue mass, once a week, followed by a mild saline, is of great benefit in some cases.

Only in emergencies, such as angina or nocturnal dyspnoea, are drugs of the vaso-dilator type, such as nitroglycerine, sodium nitrite, erythrol tetranitrate, etc., to be used. The iodides should be given very sparingly and in small dosage, never over three grains once or twice daily, unless there is a pronounced and persistent headache, or a syphilitic history, when they may be pushed to physiological limits.

In the high tension occurring at the meno-

pause, the combination of iodides and bromide is of great service. In cases where cardiac weakening is developing, and there is present distressing dyspnoea and vertigo, digitalis in small doses is very effective, paradoxical as it may appear. If dropsical conditions appear, diuretin is of decided advantage. In obese patients two grains daily of thyroid extract are beneficial in reducing weight and relieving excessive tension.

Large doses, or even an excess of ten grains a day, in my experience are, however, decidedly dangerous.

The glycerophosphates are the best tonics for these cases.

(2) *Elimination.* This can best be secured by a strict regulation of the intake, and by providing an active outlet for the waste products. All of the excretory channels must be utilized, and the kidneys, bowels and skin must have constant attention in order that these chief avenues through which elimination may be obtained may each individually do its full duty. The food supply should not exceed the patient's ability to digest, and the residue should not be allowed to decompose. Violent cathartics should never be given, but rather simple aperients, such as have been mentioned, which will secure definite drainage without straining effort.

Water, either plain or with lemon juice, and preferably hot, should be taken regularly every day, to the amount of at least one quart between meals, but at meals not more than six ounces should be taken at a time.

The condition of the skin, also, requires careful attention. The cold bath is inapplicable, but a daily tepid or warm bath for eight to ten minutes will be of great advantage.

Turkish baths, especially the use of the steam rooms, should be used with great caution. Electric-light baths should likewise be used with great discretion, for both of these may be depressing and dangerous. Excessive sweating is usually harmful, and short electric light baths, or simply hot baths, or occasional hot packs are usually sufficiently vigorous methods in skin elimination.

Vapor baths alone, without the use of water following them, are invariably weakening and harmful.

The application of massage, or of electricity in any of its forms has not been markedly and permanently beneficial in these cases in my experience.

The frequency with which any of these measures may be used should be governed entirely by indications in the individual case.

Venesection is of undoubted value in the emergency treatment of some of these cases, but as a routine procedure it is not applicable, for, to be of any continued benefit, it would have to be repeated too frequently.

(3) *Dietetic.* Just as in cases of developing hypertension, so in the confirmed cases, diet is of the utmost importance.

The aim should be to reduce gradually the quantity of food to as small an amount as is sufficient to keep the patient in good condition. He should be instructed to eat regularly and slowly and to thoroughly masticate his food, and to make the midday meal the heaviest. Most people eat too much and especially too much butcher's meat, and a diet of fish, poultry, vegetables, cheese, milk, oatmeal, stale bread or cornbread together with farinaceous puddings, buttermilk and the smallest possible amount of salt in these foods, will give the best results.

If the patient is obese, special diet should be considered as necessary in such a case. In all cases, alcohol, tea and coffee should be limited or prohibited, for they are cardiac whips which do serious injury to the cardio-vascular system.

Practically, it is sometimes almost impossible to have a patient discard these stimulants and excitants, and in such cases a small amount of whiskey, never over one and a half to two ounces a day, can be given, or its equivalent of dry sherry, and in tobacco cases, if there is tachycardia, palpitation or angina, tobacco

should be excluded absolutely, but in other cases where its disuse causes great discomfort, two ounces of smoking tobacco may be allowed weekly.

In all cases, however, when practicable, the discontinuance of these stimulants is generally followed by marked improvement.

(4) *Rest and Hygienic Conditions.* In confirmed hypertension, no agent is more efficient than rest, and usually prolonged rest in bed.

Periods of rest and quiet during the day, and certainly eight hours each night, are of the utmost importance in these cases.

The prevention of all possibility of sudden strain and the avoidance of everything tending to produce fatigue, and especially mental fatigue, should be insisted upon.

The difficult cases to advise are those leading strenuous lives of great mental activity, and such cases must demand special attention and consideration, for if they be attended by cerebral congestion, it will be necessary to enjoin absolute rest from all mental work for a stated period, or otherwise no other treatment will be of avail.

This can be managed in many ways, but tact, decision and thorough co-operation must be utilized.

As the patient improves, more latitude can be allowed and moderate exercise in the open air may be taken. Residence at the seashore is not to be advised, and altitudes above 1,500 or 2,000 feet are not advisable.

Walking or riding in the open air are to be advised cautiously, according to the blood pressure determination after such exercise, and if improvement continues, such exercise as golf, etc., in moderation, may be indulged in. The point always to be considered is that exercise should never go to the limit of tire, for any exercise plus this point means fatigue and exhaustion.

Rest is only a figurative and comparative term when applied to the physical economy, but none the less, only in so far as a certain degree is obtainable, is the attempt at treatment of thic condition worth while.

Consequently the sum and substance of all our efforts to prevent or cure vascular hypertension must resolve themselves into rational measures for the conservation of cardiac nervous tone, for without this nature cannot repair her damaged machinery nor restore and maintain her circulatory balance.

SKIAGRAPHIC APOCALYPSES IN CHRONIC CONSTIPATION.*

By E. S. Sledge, B.S., M.D.,
Mobile, Ala.

Chronic constipation has long been the trial of the general practitioner, the problem of the internist, the puzzle of the surgeon, and the "hey day" of the quack. This condition causing its irregular train of symptoms is becoming more frequent each day, principally among the English and the American people. There are three common factors that combine to augment the number of the chronically costive. These are improper habits with reference to eating and drinking and exercise, the growing habit of taking and repeating laxative drugs on the slightest provocation, and lastly the frequency and often carelessness with which the abdominal cavity is opened. The last cause can in many instances be laid directly at the door of the doctor and of course is hard to remedy if it be not due to crude surgery or inefficient diagnosis. The second cause is the secondary result of the physician too lightly advising the use of laxatives, but is far more to the credit of the perniciously active advertising of patent and proprietary medicines. The first cause appears to be an accompaniment of advancing civilization.

The problem that confronts us as medical men is to so diagnose each case that we can arrive at the proper indications for treatment. And this is very often a most aggravating end to accomplish. The principal thing to deter-

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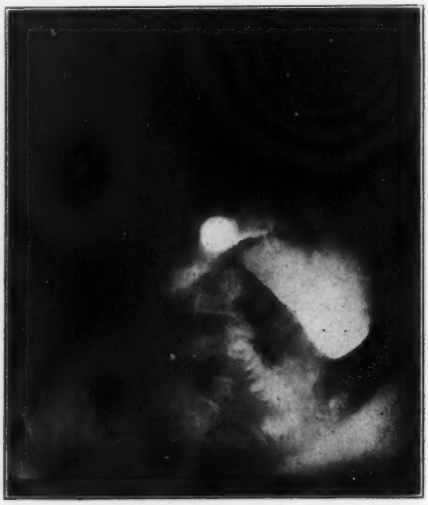
mine is whether the case is one for medical treatment or is one where surgical intervention affords the best chance for relief. Many a case is seen, a careful history is taken, we employ the ordinary means of physical examination in vogue, outline medical treatment and the patient is promptly cured or given a great deal of benefit. But unfortunately there are only a few that run such a happy course. We are forced in most to repeated examinations and all sorts of experimental measures that compare to what Abrams calls "diagnostic



CASE "A"—FIG. 1.
Stomach of a case of atonic constipation. Stomach slightly ptosed and elongated; motility is good with pyloris in normal position.

therapeutics." This all requires a great deal of time, is most often very expensive and altogether unsatisfactory and discouraging to the patient. Finally the attending physician may or may not arrive at an understanding of the underlying factors. The patient often tires of one and passes through the hands of a number of medical men each of whom possibly tries something different. The crying need is a more general realization that we have at our disposal a means of diagnosis that will in most cases promptly clear the situation and definitely point to the course of therapeusis that is best fitted to the individual case. This means of diagnosis is roentgenological examination of the gastro-intestinal tract with the use of one of the bismuth salts, or, better, barium sulphate. It is remarkable in the light of what has been and is being done how many general practitioners pay no attention to this aid to intestinal diagnosis, and these are the men who first get the most of the cases of chronic constipation, and get them at a time when accurate diagnosis and logical treatment give the best hope for permanent relief. Moreover, there are too many surgeons and internists that are in this same class, principally

CASE "D"—FIG. 1.
Stomach and colon of an interesting case of visceroptosia with chronic constipation. This patient was operated by Dr. H. T. Inge, of Mobile, after medical measures failed. He did a gastropexy and a colonopexy. Symptomatic recovery after a year.

the latter. With these the failure to employ the X-ray is due rather to nihilism and procrastination than to any lack of information as to its possibilities.

In the employment of the X-ray the ideal procedures to be sure are serial radiography, making a large number of plates at rather short intervals, or prolonged and repeated fluoroscopic study, or the two combined. However, the apparatus required and the expense of such examinations prohibit their use except in large clinics or in the instance of wealthy private patients. They are denied to the aver-

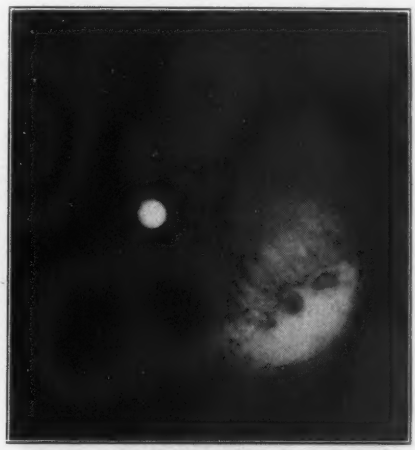
age private patient and that is the one that we mostly want to reach. I have often thought that the failure of so many of us to take advantage of skiagraphy can be ascribed somewhat to the lengthy articles that flood so many of the journals, describing such an elaborate technique. To many they are hardly understandable and appear quite impractical.

But I find that we can gain a wealth of information without resorting to such extensive examinations and that we can so do the work that the expense will come within the means of the average private patient. This possibil-

CASE "E"—FIG. 1.
Stomach of another interesting case of marked constipation. Stomach dilated and ptosed, but with good peristaltic waves.

ity has been brought about by the improved transformer type of machine, the use of soft tubes and a powerful current, and the employment of intensifying screens, especially the new American "T-E" screen. With such technique we obtain instantaneous exposures. Thus we get clear plates with almost no mottling or grain and without the confusion of overlapping peristaltic waves. Careful study of such plates proves that in the skiagraph we have truly found for chronic constipation a Book of Revelation, and hence the title of this presentation suggested itself.

The most usual type of chronic constipation is that due to improper habits of life. Here we have an almost if not purely functional aberration with little or no anatomical derangement. The X-ray reveals the absence of an actual lesion and simply gives the picture of slow passage of the intestinal contents. In fact it is very often the case that the value of the examination lies in the fact that the examination has proven negative. The stimulation of the intestinal peristalsis by the heavy metal used in many cases masks any delay that may occur in the passage through the gut of the food and drink of which the patient is



CASE "A"—FIG. 2.
Colon after eighteen hours. Slight right-sided coloptosia, with more marked central coloptosia. Bismuth only goes to middle of transverse colon. This was a mild case.

in the habit of partaking. The stimulating effect of the bismuth or the barium salt may even simulate the action of a cathartic drug and cause the patient to necessarily pass out the salt before the usual eighteen hours have elapsed that we wait after giving the salt by mouth before making the exposure for the large bowel. Fortunate indeed we are if our findings fit in with any of the above; for such presages successful treatment and great satisfaction to both the patient and the clinician. In most instances of what we may term atonic constipation we also find a moderate degree of gastroptosia and enteroptosia, but that factor is usually a negative one as far as the prog-

nosis is concerned. This class of chronic constipation we have to consider purely medical.

When the costiveness is due to a visceroptosia, of which the gastroptosia and the enteroptosia concern us principally, we may have a medical or surgical condition. This depends directly on the views of the clinician with reference to the best method of treatment. It is seldom that either gives any very great degree of permanent relief. But in the present unsettled state of our knowledge the more conservative measures usually have preference. The

CASE "B"—FIG. 2.

The colon after eighteen hours. Ptosis is but slight. Cut shows poorly, as most of the bismuth has passed out. Ordinarily a markedly constipated patient could not hold the heavy bismuth eighteen hours. Recovery under medical treatment.

X-ray reveals the stomach in varying degrees of ptosis with or without marked atony, dilatation and retention. The large gut shows one of three types of ptosis. There is simply a dropping down of the transverse colon with the hepatic and splenic flexures remaining in fairly good condition; this we call the central type of coloptosia. Again we may have the right-sided variety of coloptosia with the hepatic flexure and the transverse colon down. More rarely we find a complete ptosis of the whole large gut, but this is a comparatively rare condition, as the splenic flexure holds to its place with great tenacity. Of course with the ptosis we note a delay in the passage of the contents of the colon. These different types of coloptosia have been mentioned in the above order as that is the order of frequency in occurrence and the order of their importance as to a favorable prognosis by whatever treatment may be outlined.

The third general division of chronic constipation is that due to intestinal adhesions, and this is very frequently a post-operative sequel. Here the history of the case is of prime importance in the interpretation of the skiagraph. These cases are purely surgical and no treatment outside of operation offers any hope of cure. In this class we

CASE "C"—FIG. 2.

Although a marked case of constipation, bismuth has reached the rectum and was only held by great effort on the part of the patient. Improved on medical measures.

include strictures of the large gut which in the X-ray plate show as persistent narrowing of the canal. The adhesions proper may show part of the canal shut off from the bismuth or barium; the gut may be pulled into an abnormal position, usually bound in a fold against itself. One of the most definite findings is an absence or great reduction in the peristaltic waves at the place of the adhesions. Also here we usually find a certain amount of ptosis as a complicating factor.

The more recently described types of chronic constipation supposedly due to antiperistalsis or increased haustral segmentation may well be said to be still in the experimental stage as far as their diagnosis is concerned. One should be wary of making a positive diagnosis of such a condition. They must be studied further by means of fluoroscopy before they can be generally accepted. Moreover, they are medical as to treatment and are handled about as the ones in our first division, and give almost identical skiagrams.

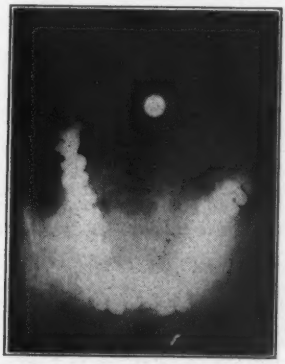
A more universal acceptance of this aid to tinely obtain good plates. The man who

CASE "E"—FIG. 2.

Colon at the end of twenty-four hours; transverse colon plastered against cecum and ascending colon, bismuth reaching to middle of transverse colon.

makes an occasional plate can never gain sufficient experience and develop a technique that will make his results really worth while. The occasional intestinal skiagraph from an office intestinal diagnosis cannot fail to strengthen our faith in it. This means its still more general use and a better understanding of intestinal physiology. The increase in the number of examinations will make each less expensive to the patient, as an X-ray operator can do a great deal of this work in almost the same time as he can do but little. It is essential for the best results that the examinations be made by one who does enough of it to be able to routine equipment is not of much advantage. The interpretation of the plates is of great importance and should not rest alone with radiologist. He contributes the technical information and the clinician contributes the clinical data and the diagnosis is made from the combined information. Either loses greatly without the other. It is well to again emphasize that gastro-intestinal skiagraphy is never a substitute for clinical methods, but is an addition to them, and when used properly a most wonderful addition.

In conclusion, I wish to show a few lantern slides that I have chosen from cases of chronic constipation. They will illustrate some of the features that I have mentioned in connec-



CASE "E"—FIG. 3.

Colon after seventy-two hours. Bismuth is only in transverse colon to splenic flexure. Notice central coloptosia. Note absence of peristaltic waves on the part of transverse colon that was against cecum and transverse colon. This denotes adhesions there. Patient is being treated medically, preparatory to operation. From the medical service of the University of Alabama.

tion with the different types of this troublesome malady. The slides are all faithful reproductions of the original negatives and represent our X-ray information in the diagnoses made. None of the plates were retouched.

DISCUSSION.

Dr. John L. Jelks, Memphis, Tenn.—This subject has opened a vast field for study during recent years. Mr. Lane aptly states, "Those who were inclined to scoff at the suggestion of the need for any surgical treatment of such a harmless and every-day condition as simple constipation, are beginning to recall that the operations,

which he had devised, were, in reality, directed against a most serious condition, in which constipation in itself plays but a part of a common, and by no means essential symptom."

Every surgeon present has operated for and removed diseased appendices, only to learn later that unpleasant symptoms persisted, which were due to the same primary cause as the appendicitis, namely: Coloptosis, Glenard's disease, Lane's Kink, bloodless fold of Treves, or an otherwise produced obstruction to a poorly drained colon.

Apropos: a recently operated case, a doctor, whose constipation of six years' duration, supervened upon alternate diarrhoea and constipation of twenty years' duration. He was greatly emaciated, copper-colored, melancholy, an invalid, whom medicine could not cure on account of the following named pathologic entities:

The colon and cecum appeared dragged downward, and the cecum outward by a cobweb-like structure or membrane. Ileo-cecal angle was acute, the membrane extended up the cecum and over the ilium, binding the appendix snugly to the caput. The transverse colon folded over the ascending colon some distance and down to the pelvis, then crossed over to the splenic flexure producing another acute angle. The descending colon and sigmoid were bound by an adhesion producing a kink.

I short-circuited, first the cecum into the sigmoid, then drained the obliterated and ptosed descending colon into the rectum. I have cured this man and given him a new lease on life. He has regained twenty-five pounds weight, lost his copper hue and his melancholia. Nothing he eats disagrees, his bowels move once or twice daily without medicine, and he has happily returned to a useful labor.

Such cases and conditions deserve our most careful study.

Dr. Sledge closes.—Gentlemen, my sole idea in presenting this subject before you is to emphasize of what great advantage simplified X-ray examination has been to me in hastening my arrival at a correct diagnosis of the causative lesion in chronic constipation. Here, as in all diseases, our first object is to reach as quickly as possible the correct diagnosis and avoid experimentation so that we may immediately institute logical treatment. In constipation time and expense is a most important factor in conducting the case to the satisfaction of all persons concerned. And I have found that skiagraphy with proper technique and careful interpretation is about the most important single factor in quickly and properly classifying cases of chronic constipation. Although the diagnosis once made, treatment is variable according to the views of the clinician, the cardinal factor is to separate promptly the surgical from the medical cases. If the case be surgical have the necessary operation done, the skiagraph having saved us months or years of experimentation trying to arrive at a conclusion. I am most enthusiastic over the value of the skiagram in this troublesome malady and advocate it as an adjunct to but never a substitute for careful anamnesis and clinical examination. A correct diagnosis is always the best; a prompt, correct diagnosis is better still; in chronic constipation the skiagraph hastens the diagnosis and betters our knowledge of intestinal physiology and thereby becomes the most important single item in diagnosis.

THE MANAGEMENT OF RAW SURFACES IN THE PERITONEUM.*

By Lucius E. Burch, M.D., F. A. C. S.,
Professor of Gynecology and Acting Dean of Medical Department, Vanderbilt University.

It is strange that while medical literature for the past two years has been prolific on the treatment of adhesions, either congenital or acquired, so little has been said on prevention. It is of almost daily occurrence that patients ask of surgeons if they will be as strong after an operation as they were before, and if they are likely to have some new disorder as a result of surgery. Inquiries of this kind cannot be treated lightly, for the reason that such conditions do too often result from operative procedures, and we, as scientific men, know that we can no longer class such results under the head of neurasthenia or superstition. It is well known that adhesions are of common occurrence after the so-called clean operations, and in those cases where raw surfaces are left uncovered, or where a septic condition is present, they are the rule rather than the exception. Adhesions are of two varieties, offensive and defensive. Unfortunately, the defensive may at times produce grave and serious complications. It is a well established fact that the visceral layer of the peritoneum is not sensitive, and that the parietal layer is, and for this reason adhesions between the viscera are not so painful or so dangerous as those between viscera and the parietal folds. It is a Utopian dream to hope to prevent absolutely the formation of adhesions following operations, but by a careful technique and a strict adherence to certain well known surgical principles, we can

*Read by title in Section on Surgery of Southern Medical Association, seventh annual meeting, Lexington, Ky., November 17-20, 1913.

do much to limit their formation. Raw surfaces in the peritoneum are the most common cause of post-operative adhesions. Ward (1), as far back as 1901, in an excellent article, expresses himself as follows: "We may lay down the statement that the formation of peritoneal adhesions after operation is directly proportional to the amount of sepsis, traumatism, dry air contact, loss of heat and raw surfaces there are present." It is not my intention in this brief paper to enter into the aetiology of peritoneal adhesions, but to those who are interested in this subject I suggest that they refer to the paper of E. H. Richardson (2). This is, to my mind, the most exhaustive paper that has been published on "Peritoneal Adhesions." He suggests an original method of covering raw surfaces on the intestine, to which I will refer later. To do good abdominal surgery it is necessary to carry out absolutely the five following rules: First, check all bleeding points. Second, cover all raw surfaces. Third, carry out a rigid aseptic technique. Fourth, avoid traumatism. Fifth, omit drainage, if possible. All raw surfaces should be sutured, if possible, and it is an added precaution that is well worth the necessary time and trouble to reinforce and cover over the first layer of sutures with a second. To emphasize this point I wish to call attention to the results of Bum (3), who, after the radical operation for cancer of the uterus found himself confronted by a 30 per cent mortality in his first 138 cases. He was not covering over the raw surfaces, and used drainage through the vagina. He reduced his mortality to 21 per cent by uniting the loosened bladder and rectal edges to the margins of the vagina. He used vaginal drainage and brought together the raw margins of the broad ligaments with a running suture. Later in his last one hundred cases he was able to reduce his mortality to 6 per cent by omitting drainage and closing all raw surfaces by a double layer of sutures, the first, a running suture uniting the raw peritoneal edges; the second re-enforcing the first and folding it over still more. If all raw surfaces in the peritoneum could be covered in this way, our task would, indeed, be easy. Unfortunately, this method is not applicable to a large number of cases, and for the treatment of such many other methods have been suggested. I will not attempt to give you a history of the many membranes, oils and greases that have been advocated, only mentioning those that have been thoroughly tested and have had a reasonable success.

Summers (4) suggests that the sigmoid be used to cover over raw surfaces in the pelvis. He has used this method in a large number of cases without an accident. I have used this method twice, and both cases made uneventful recoveries. I think it bad surgery to anchor an intestine if it can be avoided, but in a limited number of cases it offers the safest as well as the easiest method of covering over a raw surface.

Pakow (5) advises that all oozing surfaces that cannot be covered with peritoneum be touched with the cautery or alcohol for the purpose of lessening the dangers of infection or adhesion. This method is of merit, and should be used in this class of cases. Olive oil has been used extensively for the prevention of adhesions. Experience has shown that it is of little value, and in some cases harmful.

Crump (6) highly extols animal oil which is made from the omentum and appendices epiploicae of cattle. This oil is difficult to procure and hard to preserve, and for these reasons, even if it were of certain value, its use will never become general.

Hirshel (7) strongly advocates the employment of a 1 per cent camphorated oil, warmed. It is best used in cases of diffuse peritonitis where the condition of the patient will not permit of a more finished technique. He claims that the camphor acts as a stimulant for a long time, vomiting ceasing almost immediately, and peristalsis soon returns. A complication brought about a fatal termination in one of his cases and post-mortem showed everywhere smooth peritoneum covered by oil.

Neuhoff and Weiner (8) have brought out

many things of value concerning omental adhesions. They state that the movement of the omentum is entirely dependent on extraneous conditions, such as body position, distention and contraction of abdomial viscera, rigidity of abdominal walls and rythmic contraction of diaphragm. They affirm that it always adheres, first, by its free edge, and that even after the omentum is resected, the raw surface will not adhere until after a week. It has a tendency to adhere to raw areas and to go through small apertures, such as needle punctures. They advise in closing the peritoneum a stitch very similar to the ordinary subcuticular suture used for closing skin. This suture grasps peritoneum and transversalis fascia, and brings serous surface in contact with serous surface. In this way the omentum is prevented from adhering to the abdominal incision, and no crevices are left into which it may migrate.

Walker (9) claims that adhesions between the omentum and other organs cause but little trouble, but when it attaches itself to the abdominal wall it produces a great deal. He is of the opinion that when adhesions follow an operation, the patient should not be re-operated on until nine months have elapsed, unless the case is of great emergency. His reason for this is due to the fact that over 90 per cent of cases so afflicted will get well without operative procedure.

(Richardson (2) suggests an original and ingenious method of covering raw surfaces on the bowel. An incision is made through the upper leaflet of the mesentery, opposite the raw surface, one centimeter from its attachment to the bowel. With a dull instrument a flap is raised and placed over the raw area and maintained by interrupted sutures. In those cases where there is an almost total absence of fat between the peritoneal leaves of the mesentery, he considers this method dangerous on account of the likelihood of wounding the vessels, and suggests as a substitute the plication of both leaves of the mesentery over the raw area, and then fixed by silk sutures. This method is applicable only to those portions of gut that have a mesentery of sufficient length to permit of plication or separation of the leaves. Surgeons should familiarize themselves with Richardson's technique, for in a certain class of cases it will prove of great value. Sterile vaseline is a great favorite in many clinics for covering raw surfaces, and no doubt is of some little value. It should not be used, however, except in cases where time is important, for the reason that it is not so effective as other measures that consume more time in their application.

Senn, in 1888, first suggested the use of omental grafts to cover over raw surfaces and to re-enforce weak areas. This method has been thoroughly tested in animals and human beings, and is one of great worth and of wide applicability.

Coffey (10) advises the use of gauze wicks covered with rubber protective tissue to prevent adhesions in acute septic conditions of the abdomen. "All the intestines must be temporarily packed far away from the infected or denuded area or organ. Gauze wicks the size of a finger should be laid straight, side by side, reaching entirely across the abdomen and coming out through the drainage opening. Four or five layers of gutta percha tissue are then placed above the gauze and allowed to come out through the opening also." He removes the gauze wicks on the seventh day, and the gutta percha on the tenth to fourteenth. At the time that the rubber protective is removed he slips in a small rubber tube and leaves it in place to prevent the abdomen from closing over the cavity before it is healed.

Webster (11) has used peritoneal grafts, and highly recommends them. I have used omental grafts in a number of cases, and in two instances removed strips of peritoneum from the margins of the abdominal incision and used them to cover over raw areas. I have had no bad results, but in one case the recovery was rather stormy. I have, however, never had an opportunity to re-operate in a case in which I had used either the omental

or peritoneal graft, and for this reason am unable to state definitely what effect they had.

I was so interested in this method that I asked Prof. Hambleton and Dr. Rogoff, of Vanderbilt University, to make some experiments on dogs with omental and peritoneal grafts. The grafts were successful in all cases, and then they experimented by first placing over the raw areas the various pus producing germs, and then stitch on the graft. Their experiments at the present time are not sufficiently large to be of value. It is the intention of these gentlemen, however, to try out these methods in a large series of animals, and then report the results. The method of using auto plastic grafts is certainly the best and of wider applicability than any other that has been brought to the attention of the profession. It is not a panacea, however, and there are many cases where it cannot be used. Personally, I prefer the peritoneal graft to the omental, for the reason that the latter necessitates leaving a raw surface on the omentum. I remember quite well a case that I operated on six years ago for hernia. The sac contained a large amount of omentum, which was removed. In ten days I was compelled to reoperate for obstruction, due to adhesions between the raw surface on the omentum and an adjoining loop of intestine. I never now resect omentum in a hernia operation if it can be avoided. I might add that if raw surfaces are present in hernia operations, the sac can be advantageously used to cover them over.

SUMMARY.

It is essential that all raw surfaces in the peritoneum be covered or protected. The best method is to bring the edges together with a running suture, and if time permits, to use a second suture to re-enforce and cover over the first. The use of sutures is not applicable to over 50 per cent of cases, and in those cases where sutures cannot be used, I think preference should be given to the peritoneal or omental grafts. In cases of general peritonitis, associated with raw surfaces, time is an important element, and a finished technique is unwise. In this class of cases warmed camphorated oil, 1 per cent, is indicated. The method of Richardson should be used in those cases with raw surfaces on the intestine, provided, of course, the intestine has a mesentery sufficiently long. Sumners' method of using the sigmoid to cover raw surfaces in the pelvis is indicated in a small proportion of cases. All oozing surfaces should be touched with alcohol or the cautery to prevent infection. Sterile vaseline has an inhibitory influence on adhesions, and if time does not permit of other measures, it should be used.

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GALLSTONES COMPLICATING PREGNANCY AND THE PUERPERIUM: REPORT OF SIX CASES.*

By Joseph Graham, M.D.,
Durham, N. C.
Surgeon to Watts Hospital.

FREQUENCY.

Gallstones occur frequently in women. Few cases are recorded where they have given rise to symptoms during pregnancy and the puerperium. This complication is barely mentioned in American and English text-books on obstetrics.

Peterson reviewed the literature, collecting

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and tabulating twenty-five cases complicating pregnancy and ten during the puerperium.

These cases have been classified under pregnancy and the puerperium as warranted by the development of prominent symptoms. It is perfectly evident that gallstones originating previously may complicate pregnancy and be terminated in the puerperium and *vice versa*. It is impossible to estimate the first appearance of gallstones from the history of attacks of biliary colic, as the calculi may have been present for a considerable time without giving rise to serious symptoms. The diagnosis in all cases reported was confirmed by operation.

SYMPTOMATOLOGY.

Jaundice has been a particularly interesting symptom. The majority, 75 per cent, of the cases complicating pregnancy were accompanied by jaundice even when the stones were limited to the gall bladder, and jaundice was present in every case where there were also stones in the common duct.

It would appear that this large percentage of jaundice where pregnancy is complicated by gallstones is due to the tendency of pregnacy to produce jaundice in a constitutional way without the aid of blockage of the hepatic and common ducts.

DIAGNOSIS.

Diagnosis is easy if the symptoms are typical. The important thing is to bear this complication in mind, and there will be no great difficulty in diagnosing gallstone disease occurring either in pregnancy or during the puerperium.

Rupture of the gall bladder will always be confusing.

In the puerperium the diagnosis may be more difficult, as chills, fever and abdominal pain at once suggest septic infection.

PROGNOSIS AND TREATMENT.

The proper course is to disregard the pregnancy and treat the patient according to the gallstone indication. Mild cases can be tided over by medical treatment. If the gallstone symptoms become urgent, operate at once.

Pus in the gall bladder, accompanied by chills, fever, pain and jaundice will produce miscarriage.

Operations for gallstones are no more likely to produce miscarriage than are other abdominal operations the surgeon is called upon to perform upon the pregnant patient.

Of twenty-three cases of gallstone operations performed upon pregnant women, reported by Peterson, only three miscarried.

The more advanced the pregnancy the greater will be the technical difficulties in carrying out the operative procedures and the necessary manipulation of the enlarged uterus adds to the liability of miscarriage.

Important considerations are the skill and experience of the surgeon and especially the type of operation performed. We should select the procedure which can be performed in the shortest possible time consistent with the existing pathological condition. We should avoid long anesthesia, extensive exposure of the uterus, and reduce to a minimum all traumatism from manipulation.

Of the twenty-five cases complicating pregnancy reported by Peterson, twenty-three were operated upon with three deaths, a mortality of 13.04 per cent. Of the ten cases occurring in the puerperium, nine were operated, with one death, a mortality of 11.1 per cent. From the nature of these cases operation was only performed for urgent indications. Therefore this was a remarkably good showing.

REPORT OF CASES COMPLICATING PREGNANCY.

Case 1.—Ruptured gall bladder. Called by Dr. George H. Ross to see case of diffuse peritonitis, cause unknown. The illness of three days' duration, followed a blow on abdomen inflicted by husband of patient. P., aged 36, mother of three children, six months alvanced in pregnancy. Temperature 103, pulse 160, respiration 40, abdomen distended, uniform muscular rigidity, very slight peristalsis heard on auscultation. Patient suffering extreme pain and vomiting frequently. Jaundice present and noted. Patient said she was always yellow when pregnant. No definite diagnosis was made. Rupture of the uterus was considered.

Operation.—Incision through the right rectus revealed a large quantity of bile stained fluid;

three gallstones were removed from the peritoneal cavity. The gall bladder was found to be ruptured and contained one stone; two other calculi were found wedged into the cystic duct. All calculi were removed, drainage instituted, and the incision closed. The patient died immediately after the completion of the operation.

Case 2.—Patient brought to me by Dr. J. D. Maynard. P. W., aged 38, mother of nine children, five months pregnant. Diagnosis: Acute empyema of gall bladder. Temperature 102 3-5, pulse 125. Patient jaundiced red, flush of face, severe pain, marked rigidity and tenderness over gall bladder.

Operation—Cholecystotomy. Removal of eighty-odd stones from gall bladder and cystic duct; no stones in common duct. Perfect recovery. Was later delivered by Dr. R. S. Baynet at full term. Six months ago operated upon this patient for Dr. R. S. Baynet for an ovarian cyst twisted upon its pedicle, producing gangrene and rupture of the cyst wall.

Case 3.—Patient refererd by Dr. Montague. Aged 36, mother of four children, seven months pregnant. Diagnosis: Empyema of gall bladder, symptoms typical, local pain, tenderness and rigidity, jaundice, flushed face, temperature 103, pulse 130. Immediate operation.

Operation.—Cholecystotomy. Removal of sixty-odd stones from gall bladder and cystic duct. No stones in hepatic and common ducts. Perfect recovery. Patient went to full term and normal delivery.

REPORT OF CASES OCCURRING DURING THE PUERPERIUM.

Case 1.—Patient referred by Dr. J. J. Nurkin. Mother of eight children; was delivered of her last child four weeks previously. Had not been well during the past year, suffering repeated attacks of colic. Had been advised to have an operation for gallstones eight years before present attack. A few days before I saw this patient she had been seized with severe abdominal pain, followed by vomiting, pain and marked tenderness, restricted to the gall bladder area. A distinct tumor could be outlined by careful palpation and percussion. Temperature had been normal, but rose to 102 the day I saw her and pulse to 120. There was no jaundice. Leucocytosis 22,000 and urine showed both albumin and casts. Patient transferred to hospital.

Operation.—Cholecystotomy. Gall bladder distended with a mucopurulent fluid, no bile, several dozen stones from gall bladder and cystic duct, was followed by a free flow of bile and examination revealed no stones in hepatic or common duct. Drainage instituted and incision closed. Recovery prompt and satisfactory. Rapid improvement of kidneys.

Case 2.—Called in consultation by Dr. Wilson. Patient delivered of her third child two weeks previously; was suffering with abdominal pain, chills, fever and marked jaundice. Until I detected the jaundice I had suspected, from the history, septic infection. An examination of the upper abdomen revealed marked rigidity and tenderness. The history was the story of repeated attacks of biliary colic.

Operation.—Cholecystotomy. Stones removed from the gall bladder and cystic duct. No stones found in the hepatic or common duct. Drainage instituted; patient made satisfactory recovery. Three months later this patient had typical attack of biliary colic followed by jaundice. These attacks were frequently repeated and jaundice was almost constantly present but varied in intensity. We had overlooked the important stone, and it was floating in the common duct. Operation was urgently advised and declined until two years later, when patient developed complete obstruction of common duct accompanied by chills, high fever and intense jaundice. The patient reacted from the operation, but on the second day developed uncontrollable hemorrhage, a constant ooze of blood and gradually bled to death.

This case serves to indicate some of the difficulties and dangers of surgery of the biliary tract.

The complications are due to delay. The complications produce the difficulties and the dangers. The chief difficulties are adhesions and the certain removal of all stones. The chief dangers are dissecting, sepsis and postoperative hemorrhage. Postoperative hemorrhage is dependent upon jaundice. The blood of a deeply jaundiced patient will not clot and the wound continues to ooze until the patient bleeds to death.

Case 3.—C. L. H., aged 39. Patient referred by Dr. J. M. Manning. A mother of five children. Delivered ten days before present illness; normal pregnacy and normal labor. Illness began suddenly in night of tenth day of puerperium. Patient siezed with sudden agonizing pain in epigastrium, followed by vomiting. Pain continued constantly for the next day. No history of previous attacks. At this time there was no jaundice and no elevation of temperature. During second night

patient had a chill and next day intense jaundice developed and was accompanied by rise of temperature and frequent chilly sensations. Diagnosis of the obstruction of the common duct was confirmed by the local pain, tenderness and rigidity. As this patient had a very weak heart and positive disease of the kidneys, immediate operation was deferred by Dr. Manning for further examination. In a few hours we found the jaundice deeper, the pulse weaker and the pain unbearable.

Operation was performed in the patient's bedroom, as it did not seem practical to move her to the hospital. Cholecystotomy revealed thirty-odd small, fresh, soft stones in the gall bladder. There were no stones in the common duct or hepactic duct. The head of the pancreas was very much swollen and congested. Drainage instituted and the incision closed.

The weak heart caused a most alarming convalescence. Acute dilatation of the stomach threatened to prove fatal, but was finally relieved by repeated use of the stomach tube. Patient made a full recovery. Her health is now as good as before this attack. So far as she knows, this is the only attack of biliary colic. Has always enjoyed a good appetite and perfect digestion.

REFERENCE.

Peterson: Gallstones in Pregnancy and Puerperium. Transactions American Gynecological Association, 1910.

DISCUSSION.

Dr. W. A. Kirk, Hendersonville, N. C.—I would like to ask Dr. Graham if he has ever used normal saline in connection with his post-operative hemorrhage in those cases.

Dr. H. P. Linsz, Wheeling, W. Va.—The doctor's paper was very interesting as well as instructive. We run across these cases quite frequently and his plan of treatment of this class of cases appears to me to be the proper procedure. I believe in operating when you find the symptoms are conclusive and the condition of the patient does not contra-indicate operation.

I was called to see a patient who had given birth to a child the day previous. The doctor told me that during labor the patient complained of excruciating pain on the right side under the ribs. After the baby was born these pains continued; otherwise the patient appeared to be getting along nicely. The following day the pain ceased and a general peritonitis developed; that night the patient died.

Post-mortem examination revealed a rupture of the gall-bladder which evidently took place during labor, and scattered about in the abdominal cavity were about 250 gallstones, each about the size of a pea. Evidently this gall-bladder had ruptured during one of the pains.

Dr. J. D. Chason, Bainbridge, Ga.—I wish to thank Dr. Graham for his paper. The first thing I wish to suggest in those cases: Of course we all know the proper procedure in pregnancy with appendicitis, the earlier we operate the earlier the patient will get relief and more often save the patient.

A few years ago I overlooked a gall-stone in the cystic duct and the patient had hemorrhages from the bowels, uterus, vomited, etc. I treated the patient until four weeks had elapsed and I turned her over to my friend, Dr. McRay, who operated in Atlanta, and the patient died on the second day. He said she told the nurse she was going to die.

The point I wish to suggest: In a case of pregnancy I do not use chloroform anesthesia. I think it a dangerous thing in a pregnant woman because the changes in the liver cells, and particularly in a complication of a gall-bladder. I will not use chloroform as an anesthetic.

Dr. Graham closes.—Mr. Chairman and gentlemen, I appreciate your attention very much. In regard to post-operative hemorrhages following gall-bladder operations complicated by jaundice, I have only seen two cases. I used the calcium chloride in one case. I do not believe there is any drug that will control post-operative hemorrhage following an operation on a deeply-jaundiced patient. Some bleed; some don't. Why, I don't know. We must have thorough hemostasis. The best way to treat it is by prevention. We must urge the operation of our bile-tract cases before they are jaundiced, then they are safe. Certainly the dangers and difficulties of gall-bladder surgery come from delay. With the exception of cases complicating pregnancy, I look upon jaundice not as a symptom of gallstones, but as a late symptom due to blockage of common or hepatic duct by inflammation or stones.

The point I wished to stress was this: That all of our pregnant cases that had gallstone disease and all the puerperal cases that had gallstone disease also had greatly damaged kidneys. I do not know what the relationship is between the diseases of the bile-tract and the diseases of the kidneys, but I have found them frequently associated. We have also noticed associated myocarditis, and it is wonderful the improvement that occurs after a thorough drainage of the biliary tract.

THYRO-GLOSSAL CYST AND FISTULA*.

By Hermann B. Gessner, M.D.,
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In 1908 I first came in contact with a case of this kind, which, in the absence of a correct

*Read in Section on Surgery of the Southern Medical Association, seventh annual meeting, Lexington, Ky., November 17-20, 1913.

diagnosis, had been subjected to a primary incision and two subsequent operations. Fully as ignorant as my predecessor, I in turn operated on the case three times, each time endeavoring to extirpate more completely the obscure lesion present. Later he applied to another hospital, where, under the diagnosis of "post-operative fistula of the neck," irritants and caustics were injected without success. When in a subsequent case (H. W. P., cited below) the diagnosis was made for me by one gifted with extraordinary learning and a varied experience, I determined to investigate the ocurrence of this condition in our midst. In the Charity Hospital of Louisiana, located in New Orleans, probably the largest institution of its kind in the South, and one of the largest in the country (beds number 1,100), I examined the records for thirty-two years, from 1880 to 1911, inclusive. The total cases disposed of in that period (i. e., total population less cases remaining) amounted to 249,799 patients of both sexes and practically all races, without a single record of a thyroglossal cyst or fistula. In the report for 1912, not yet available, there should appear the case of a negro (W. O., reported below). That there have been cases under treatment, but unrecognized, is shown by such diagnoses as "infra-hyoid cyst," "congenital fistula of neck," amounting to four cases. These figures necessarily leave out of account the outdoor clinics, the diagnoses of whose cases, numbering since 1891 as many as those here summed up from the indoor service for 1880-1911, are not recorded.

Turning to the records of a special hospital, the Eye, Ear, Nose and Throat Hospital, of New Orleans, I investigated the records of its entire period of existence, 1890-1911, covering a total of patients numbering 126,228. In this total I find recorded no case labeled thyroglossal cyst or fistula, while eight patients are recorded as presenting "cyst of subhyoid bursa, cyst of hyoid region, hyoid cyst, infra hyoid cyst of neck, or post-operative fistula of neck," this last probably representing my own case (W. O., cited below).

The apparent lack of information on this subject suggested to me the reporting of three cases that fell under my observation, as well as of a fourth, the notes of which were kindly given me by my colleagues.

Before proceeding to the reports of the individual cases I shall briefly review the etiology of this condition as given by Andrews in Keen's Surgery, Vol. III, p. 280.

Morgagni and Bochdalek described a blind pouch or depression on the dorsum of the

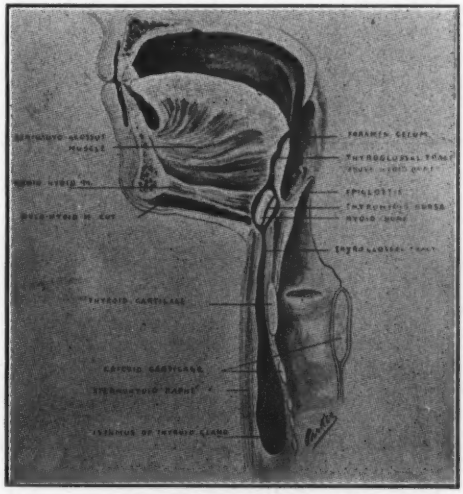

Fig. 1. (From Keen's Surgery.) Thyroglossal Tract and Its Relations.

tongue called the foramen cecum; it marks the outlet of an obliterated canal, in fetal life an epithelial blind pouch. His, by dissection of human embryos, proved the existence of such a duct, and showed it to be a stage in the development of the thyroid gland. In the fifth week, an embryo of 7.5 mm. size has a thyroid that is a mere vesicle, developing on the back of the tongue. Glandular acini appear at eight weeks, when the vesicle is bilobar with an isthmus. Mueller and Koelliker found gland tissue at eight weeks, Horsley gland secretion at twelve weeks, Polade thyroidal

colloid matter at five months. In the embryo, in a location called the sulcus arcuatus, is found what Minot calls a slender hollow pedicle at the groove between the tissue about to form the epiglottis and the tuberculum impar, which later develops into the tongue. The obliterated upper end of this pedicle is later the foramen cecum on the back of the tongue. Here we locate the anlage (embryonic nucleus) of the thyroid. The thyroid sinks and

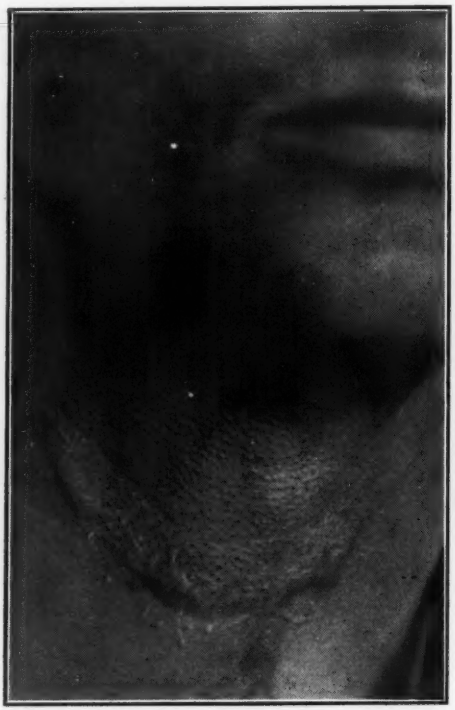

Fig. II.

leaves the tongue, normally obliterating its duct. Unobliterated portions of this descending canal with a lining of epithelium form congenital thyro-glossal tracts or cysts or "ducts." (Fig. I.) The last term is objected to by Butlin on the ground that it is not a true duct, as it has no such function. When these displaced remnants contain thyroid-gland tissue they become "accessory thyroids."

Case I. H. W. P., color white, sex male, age 22 years, occupation street car conductor. Family and personal history negative. Age when first observation was made, 13 years; age at rupture, 13 years. Description: At the age of 13 years patient suffered with his throat; a so-called boil appeared on his neck, which ruptured and continued to discharge up to the time of admission. At this time (February 5, 1912) he presented a fistulous opening in the middle line of the neck, over the lower part of the thyroid cartilage, the center of a puckered area of skin. The finest probes passed into this opening followed for the

Fig. III.

distance of about one inch a tract running upward. Attempts were made to inject this tract with bismuth paste and with argyrol for the purpose of obtaining a skiagraphic outline of its course. It could not, however, be traced by this method beyond the lower margin of the hyoid. The diagnosis of thyro-glossal fistula was made by Dr. Rudolph Matas, senior surgeon of Touro Infirmary, through whose courtesy I was permitted to treat the case. The diagnosis was sufficiently confirmed, as we thought, by the fact that an

injection of methylene blue through the fistulous opening was promptly spat up by the patient. He was operated on by me under ether anesthesia February 24. A curvilinear incision was made a little below the fistula and the convex flap of skin turned up. The median tract was then dissected up, following it to the thyroid body below, between the thyroid cartilage and hyoid bone above to the base of the tongue. The uppermost part of the tract was followed through its continuity with the better identified lower portion. Closure with drainage. Prompt healing. Results shown in

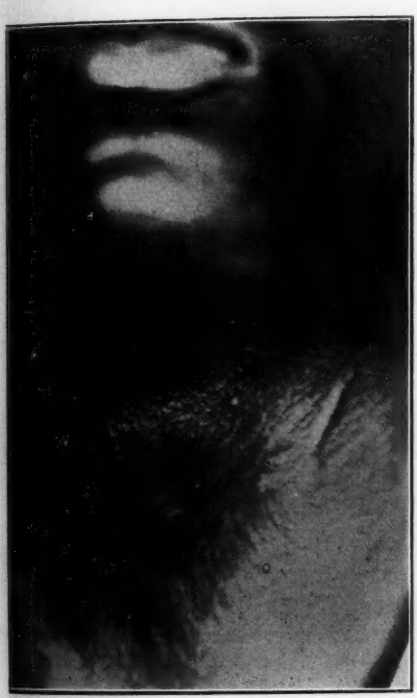

Fig. IV.

Fig. II. Patient still well in May, 1913, when the picture was taken. Examination of the tissue removed threw no additional light on the case.

Case II. J. LaB., color white, sex male, age 5 years, occupation school boy. Age when first observation was made, 2 years; age at rupture, 5 years. Description: Swelling was observed in midline of neck, just above thyroid cartilage, in 1909; this lasted about two months, then gradually disappeared. The following year the swelling returned and ruptured, discharging fluid for some time. In 1911 it again became prominent and was aspirated. In June, 1912, there was a swelling, globular, fluctuant, about 2½ inches in diameter, the center corresponding to the interval between hyoid and thyroid. This ruptured on July 1, 1912. Operation was done July 3, practically as in the previous case. Healing prompt. No confirmation by injection. Examination of tissue negative. Result shown in Fig. III. Patient well May, 1913.

Case III. W. O., color negro, sex male, age 21 years, occupation laborer. Age when first observation was made, 14 years. No rupture. Incision at 14 years. Description: Swelling described as a round ball between hyoid bone and thyroid cartilage; was incised after a few weeks; was operated on twice, no success, before coming to Charity Hospital. Condition not recognized. Three

Fig. V.

excision operations were done by me without success. In one of these operations, at a time when the fluid of the tract was encysted, no fistula existing, about an ounce of straw-yellow, viscid fluid was evacuated. The patient then, while serving as orderly, went to the Eye, Ear, Nose and Throat Hospital; there, probably under the diagnosis of "post-operative fistula of the neck," which appears among the diseases treated in 1911, he was treated with caustic and irritant injections. Having in February, 1912, had the opportunity of dealing with Case I (H. W. P.), I looked up W. O. and had the good fortune to be able to operate on him again in August, 1912, this being my fourth operation on him. The diagnosis was confirmed by means of a methylene blue injection of his fistula, the colored fluid being promptly spat up. The operation was satisfactory; prompt

healing; patient still well May, 1913. Result shown in Fig. IV.

Case IV. Color negro, sex female, age 11 years, occupation none. Age when first observation was made, 2 months; age at rupture, under 1 year. Description: A swelling was noticed over front of neck, which burst, discharging fluid for a time, then closed; this was repeated several times. At the age of 11 years she was taken to Drs. Henry and Hardy, of Lecompte, La., to whom I am indebted for the opportunity of reporting this case, represented by Fig. V. At this time, March, 1913, there was a swelling over the thyroid cartilage, soft, presenting about its center a small median opening covered with scab. The removal of this scab was followed by a sero-mucous discharge. The skin around the opening was hard and puckered. There was felt a small cord running down to the thyroid gland. Filiforms could be introduced for about an inch. In March a palliative operation was done. When the patient was seen in May there was again to be seen a median opening covered with scab, discharging a slightly viscid fluid. At this time injection of a quinine solution was immediately followed by a complaint about a bitter taste.

Fig. VI. (From Keen's Surgery.) Thyroglossal Fistula. Valve formation at lower end.

It should be noted that recurrence of the fistulous condition occurred in less than three months after operation. This was my observation in case III, on whom I did three unsuccessful operations. The cases I to III, reported above, may therefore safely be called cured, as ten months have elapsed since the last was operated on.

Comment: The statistical study of the occurrence of this condition in New Orleans hospitals would lead one to suppose it a very rare one. However, the fact that I had occasion to deal with three cases in one year, and shortly thereafter had a fourth brought to my attention, convinces me that these cases are more numerous than local hospital reports show, but in some way escape diagnosis.

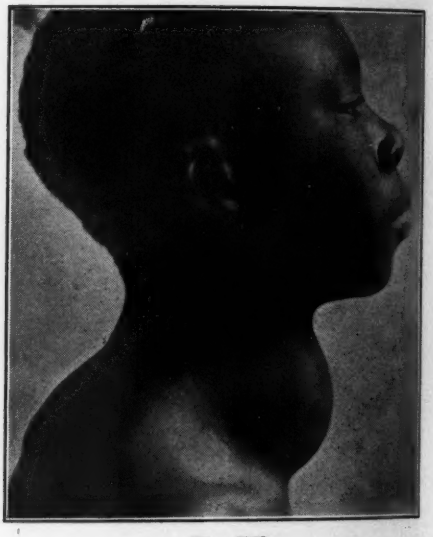

Fig. VII.

The age at appearance in these cases varied from two months to fourteen years. Appearance is shortly followed by rupture, though in case II there was an interval of two years before aspiration, and another year then intervened before rupture took place.

It is difficult to draw conclusions as to the influence of race and sex from four cases.

These were two white and two black, three male and one female.

The diagnosis is usually made by the presence of a cyst or a fistula mesially situated between hyoid bone and thyroid gland. (Fig. VI.) The injection of a median cervical fistula with a colored solution, followed by a prompt return of the fluid through the mouth, establishes the diagnosis quite positively. The diagnosis of a cyst is not quite so easy. If it is distinctly limited to the space between thyroid cartilage and hyoid bone it may quite safely be accepted as thyro-lingual. If it descend below the thyroid cartilage top to a considerable extent, the diagnosis is not easy and may have to be made by actual exploration. In support of this statement I offer (Fig. VII), a picture of a negro boy, aged sixteen years, who presented a median cervical cyst which dated back to early life. Diagnosis before operation was cystic thyroid. In the course of the operation the cyst was easily peeled from over the thyroid gland and the lower part of the thyroid cartilage to the top of the latter structure, where it had its origin. There was no sign of any connection through the hyo-thyroid space with the base of the tongue on which the diagnosis of thyro-glossal cyst could be grounded, though this was the conjecture when thyroid cyst was eliminated. Examination by the pathologist was followed by a report which, though not final, suggested the possibility of a dermoid.

The above applies, of course, only to a closed tract presenting a cyst, or to one open anteriorly. It is possible for the tract to burst posteriorly, at the foramen cecum, and continue to discharge there.

The importance of these conditions depends on the inconvenience and deformity resulting, no serious element existing.

Treatment formerly was by the injection of caustics and irritants, the use of which has proved futile. Excision is the approved method today. It is aided by the outlining of the tract with fine probes, or by staining with various solutions, such as argyrol and methylene blue. Of my own cases the methylene blue had been injected in two, but this was of no assistance to me, probably because the solution was quite a weak one. In these cases I was able to follow to the base of the tongue, between hyoid and thyroid, the indurated tissue leading to the cutaneous fistula.

The usual incision recommended is a median one, shown in Fig. VIII. A curvilinear incision, the normal one for the neck, is, in my opinion, preferable, as the rectilinear median one may possibly be followed by a prominent

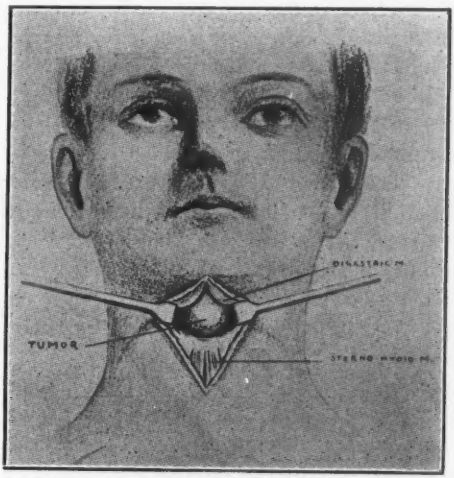

FIG. VIII. (From Keen's Surgery.) Operation for Thyroglossal Duct. (J. B. Murphy.)

scar bridging the hyo-thyroid space, and may possibly restrict extension of the neck.

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DISCUSSION.

Dr. W. E. Sistrunk, Rochester, Minn. (by mail)—During 86,000 admissions to the Mayo clinic there were thirty-one cases which were diagnosed as thyro-glossal duct cysts or fistulae. Of these, eighteen were males and thirteen were females. The trouble had appeared from birth to fifty-three years; the majority of these patients had noticed trouble when between twenty and twenty-five years. The patients with fistulae had had discharging sinuses from six months to twenty-nine years. Twenty-five of these thirty-one patients had swelling occurring around the hyoid bone and two cases had tumors pointing over the sternal notch. A number of the patients had had from one to seven previous operations with recurrences. In 86,000 cases there were twenty-one diagnosed as branchial cysts.

THE RELATION OF THE LATERAL SINUS TO THE MASTOID OPERATION.*

By Adolph O. Pfingst, M.D.,
Louisville, Ky.
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As we all recognize in the lateral sinus, with its irregularity of course, one of the greatest dangers that we encounter in the performance of the mastoid operation, a study of the relations of the sinus to the mastoid bone is always of more than ordinary interest.

From the standpoint of the otologist, the horizontal portion of the transverse or lateral sinus, that portion extending from the torcular Herophili to the knee, is of little interest. However, below the knee, that point where the horizontal portion makes an angular turn to become continuous with the vertical or oblique portion, the vein bears a most important relation to the mastoid bone.

This portion of the vein, which on account of its course has been called the sigmoid sinus, runs along the posterior surface of the petrous bone near the posterior inferior angle, taking a course forward, downward and slightly inward. Near the apex of the bone it makes a turn inward into the juglar fossa, where it becomes continuous with the bulb of the jugular vein. Just before it enters the jugular fossa it becomes more narrow than elsewhere. The bulb is continuous downward with the internal jugular vein.

At the knee the sinus is joined by the superior petrosal sinus and in the middle of its course posteriorly it receives the emissary mastoid vein.

If we could, with any degree of certainty, count upon some regularity of the course of the sigmoid sinus, the danger of its injury during mastoid surgery would not be so great, but we find marked variations in its course, its size and its relation to the surface of the bone, depending upon the age of the subject and the conformation of the bone and the side involved.

In some bones the groove in which the sinus runs is shallow, while in others it is quite deep and forms a well defined furrow.

Although a large sulcus is always indicative of having carried a large sinus, a small sulcus does not necessarily mean that the sinus was proportionately small, as the sinus, even though large, may hardly mark the bone on account of its situation further away from the bone between the layers of the dura.

Katz has pointed out that in those bones marked by a deep sulcus the groove is most pronounced in three distinct places. At the beginning of the sigmoid sinus, just below the knee it is at times quite deep, so that it extends to the cortex of the mastoid bone. In extreme cases it has been found to extend so far forward as to come immediately up to the posterior wall of the antrum, the latter being separated from it by a very thin, translucent sheath of bone, or it may form the posterior inferior wall of the antrum itself without any intervening bone. In the middle of its course the sigmoid sinus frequently encroaches upon the middle of the mastoid bone and occasionally reaches the cortex just behind the external auditory canal below the antrum.

The lowest of the three usual displacements is frequently found encroaching upon the occipital bone. The entire mastoid may be encroached upon by the sinus, leaving only a shell of bone surrounding it.

Zuckerkandle, Hartmann and others report dehiscences along the course of the sulcus of the sigmoid sinus, some of them of considerable size. They have been found at every part of the course of the vein, more especially towards the posterior wall of the ear canal, the tympanic cavity and reaches the pericranium. The

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average diameter of the lateral sinus is from 8 to 10 mm.

Just before it enters the jugular fossa it is subject to considerable variation in size and course. In some cases it turns downward without making an elbow, practically merging into the jugular vein. In such cases the jugular fossa is very shallow and the bulb not well defined. In other specimens it bends sharply around a well-defined bony ridge at the edge of the jugular foramen. In such cases the bulb is large and reaches a higher level.

Although the sinus is usually somewhat smaller just before it enters the jugular fossa than it is in the rest of its course, it is not uncommon for it to become quite a good deal smaller at this point. At times it has been found so narrow that the overhanging posterior inferior edge of the petrous bone almost closed it in as a canal.

From the measurements of series of skulls by different observers the fact has been established that in most cases the right sinus is larger and displaced more forward than the left. The cause of this inequality in size has been explained in that the right lateral sinus is a prolongation of the superior longitudinal sinus, while the left one springs from a smaller vein, the straight sinus. In some skulls the right and the left sinus are alike in size and in only a small percentage the left one is larger and runs more forward than the right.

The relations of the sinus during childhood differ considerably from those in adults. Cheatle (Hunterian Lectures, page 69) says that in infancy the sinus lies in a horizontal position below and behind the antrum and is separated from it by dense cancellous bone. The sinus does not form the sharp turn at the knee, but runs more directly towards the jugular foramen which it enters without making the angular turn frequently seen later in life, hence it is not only relatively but also actually shorter than in adult life.

As growth takes place the sigmoid portion of the sinus adopts a more upright course and becomes more tortuous, coming in close relationship with the posterior wall of the antrum and the upper part of the mastoid process, and making a sharper turn to get through the jugular foramen. The tortuosity seems to increase with age, perhaps on account of the venous pressure against the bone, so that in very old individuals we sometimes observe quite a deep sulcus. (Case 6.)

According to Braislin (Laryngoscope, 1911) the jugular fossae are shallow and nearly always alike in the new-born, but they increase in depth, and after the fifth year the inequality in depth and size of the right and left fossae is observed just as it is in adult skulls.

On account of the more frequent forward course of the sinus on the right side and the more highly developed bulb with the consequent existence of dehiscences, Korner believes that ear disease on the right side is more dangerous than on the left.

Politzer has found that in the large pneumatic mastoids, the distance between the sinus and the posterior meatal wall is greater, and the danger of injury of the sinus during operation correspondingly less than in the cancellous or compact bone.

According to Wanner (Katz Handbuck der Specillen Chirurgie des Ohres, etc.) the upper part of the lateral sinus is most apt to be injured in old cases of middle ear suppuration with sclerosed bone and the middle portion in the acute cases of mastoid disease with marked cancellous or pneumatic tip.

With such a variance in the course of the sinus there is a question as to what should be regarded as its normal course. Many measurements have been made to determine the average distance between the sigmoid sinus and the posterior wall of the meatus, the measurements varying from 5 to 19 mm. (Hartman). Amberg (N. Y. Med, Journal, September, 1905) has suggested the supra-meatal spine as a point of measurement, and as a rough estimate places the dividing line between the normal and the protruding sinus 10.6 mm. behind the spine.

The frequency of the forward sinus has been variously placed with an average of from 6 to 7 per cent of cases.

The bulb of the jugular and the fossa retaining it are also subject to great variation in size and shape. While in some specimens the fossa is so shallow that it is hardly recognizable in others it is well defined. In some specimens it has been known to extend so high upward that the sinus encroached upon the tympanic cavity through a dehiscence in the bony floor of the cavity. It has also been found to encroach posteriorly upon the petrous bone, and internally upon the condyloid process of the occipital bone, leaving only a thin plate of bone between it and the spinal canal. The anomalous position of greatest importance to the mastoid operator is its displacement backward towards the sigmoid sinus. Whenever this displacement is pronounced, the bulb may be very close to the middle portion of the sigmoid sinus if this is protruding.

To illustrate our subject I have secured ten skulls from the surgical laboratory of the University of Louisville. In six of this number the sinus groove on the right side is larger and situated more forward than the one on the left.

In one specimen (No. 6) the skull of a gray-haired man, the sinus in its first part made a most pronounced groove in the base of the petrous bone.

In three of the others there was only a slight difference in favor of the right, while in only one the left groove was larger and more forward and the jugular foramen and fossa larger than those of the opposite side.

It was a notewothy fact that in all of the specimens with large forward sinuses the jugular foramen was large, and in most of them the bone was marked by a well developed prominence just at the edge of the foramen. In such cases the fossa for the jugular bulb was very large and extended high into the bone. On the side of the small sulcus (usually the left side) the foramen was uniformly small and in several specimens extremely small, while the jugular fossa was very shallow.

While ten specimens cannot in any way be taken as conclusive evidence of the difference in the size of the right and left sinus, it verifies the result of many other observations. It seems to have been conclusively proven by the study of many skulls that the right sinus is larger than the left in a large majority of specimens, and that the reverse of conditions is rather to be looked on as an exception. So also the large jugular foramen and the large deep bulb on the rigth side compared to the left is the rule, and the reversal of conditions the exception.

My recent clinical experience would also lead me to believe that the forward sinus is more common than is generally believed. It would seem as a rather peculiar series of cases to find the sinus quite close to the mastoid antrum or to the ear canal eleven times in my last fifty cases, including acute and chronic forms. In nine of this number the vein was displaced forward in the first part of its course, and in two (Cases 9 and 10) in the second part.

I will ask your indulgence while I make a synopsis report of these cases with reference only to features bearing on the title of our discussion.

Case 1—Boy 8 years old. Acute mastoid abscess, left side, following two weeks of acute middle ear suppuration. Pus exuded as though under pressure at the first blow of the chisel over Macewen's triangle. A large cavity was found filled with pus and granulation. It included the antrum and extended backwards to the bare sinus, of which about one-half inch was bare. Below antrum the sinus extended forward almost to the ear canal.

Case 2—Boy 8 years old. Acute mastoid abscess, right side, following four weeks of acute otitis. Sub-periosteal collection of pus. Fistula over Macewen's triangle leading to an antrum about one-fourth inch in size. The antrum had firm, bony walls, except posteriorly, where a very thin layer (one-sixteenth inch) of soft bone had separated the antrum from the sinus. Removal of all of the softened area exposed about one-fourth inch of normal sinus.

Case 3—Boy 17 years old. Acute mastoid ab-

scess, right side, following acute middle ear suppuration of six weeks' duration. Elevation of the periostium over the mastoid disclosed a fistula just behind the ear canal on a level with its superior wall. This led to a cavity one-half by three-fourths inch filled with pus and granulations. The cavity itself was lined with healthy firm bone, with the exception of the posterior wall, which had a dehiscence through which the healthy sinus was visible.

Case 4—Boy of 17 years. Mastoid abscess of the right bone following acute otitis with pus discharge of four weeks' duration. Operation revealed a rather large and superficial antrum filled with pus. Part of the floor and posterior wall of antrum was apparently formed by uncovered sinus, as this was readily exposed by cleansing the antrum without removal of bone backward.

Case 5—Farmer 19 years old. Acute mastoid abscess on the left side following otorrhoea of two weeks' duration. Operation revealed adherent periosteum over Macewen's triangle. Its removal with curette lifted a thin spicula of bone and liberated pus from the antrum. The large antrum filled with creamy pus was marked posteriorly by a necrotic area, whose careful removal with a curette exposed three-fourths inch of sinus.

Case 6—Grocery clerk, 20 years old. Acute middle ear abscess, left side, mastoid abscess two weeks after beginning of otorrhoea. Considerable sub-periosteal pus over region of mastoid, fistula in bone leading to large antrum filled with pus. The antrum, posteriorly and upward, had healthy sinus for its floor over an area of over one-fourth inch.

Case 7—Young lady 20 years old. Acute otorrhoea, right side, of six weeks' standing followed by mastoid abscess.

Rather superficial large antrum filled with pus and granulation tissue. Below the antrum necrotic bone was removed backward to sinus. In following this upward it was found that the sinus was separated from the antrum by a mere crust of soft bone.

Case 8—Married woman 22 years old. In advanced stage of pulmonary tuberculosis and who had been operated on for acute mastoid abscess on the left side a year previously without exposing the sinus, although almost the entire tip of the mastoid was removed and a large antrum cleaned out.

The abscess of the right mastoid followed an otorrhoea of over three weeks' standing. Upon lifting the periosteum a large area of porous necrotic bone was exposed over the tip of the mastoid. A large area of necrotic bone was removed, including the entire tip of the bone and extending close to the ear canal.

But a short way backward at this point the necrotic bone and granulation were in contact with the lateral sinus. Towards the tip the sinus extended backward. The antrum which was subsequently opened was very small and contained a quantity of stringy pus.

Case 9—Trained nurse 26 years old. Had been operated upon two years previously for a mastoid abscess on the right side without exposure of the sinus, although considerable of the mastoid bone was removed.

The left mastoid developed an abscess two weeks after beginning of otitis. The antrum, which was very deep, was free of pus. The tip contained a large pus cavity. Projecting into this cavity posteriorly an elevation of apparently normal bone. In removing spicula of bone from the highest portion of this projection quite a gush of blood from an opening in the bone revealed a forward sinus in the second part of its course.

As the operation was about completed when this accident occurred, the wound was plugged and the case dressed.

Case 10—Married woman 40 years old. Mastoid abscess, left side, after two weeks of acute middle ear suppuration. Anatomical conditions identical with the preceding case.

In removing a necrotic tip, the sinus was uncovered, bulging far forward into the tip, considerably below the level of the antrum.

Case 11—Colored woman. Otorrhoea, left side, six weeks, followed by an acute abscess of the left mastoid bone.

Operation revealed a very large antrum about one-fourth inch from the surface having a small area of sinus posteriorly for its floor.

Although these cases are not offered as conclusive evidence of the frequency of displaced sinuses, they serve to reimpress the uncertainty of the course of the vein. Among the quoted fifty operations there were quite a number in which the sinus was somewhat forward and in which the vein was exposed during the operation, but in the eleven reported cases the displacement forward was quite pronounced. Strangely the anomaly was observed more often on the left than on the right side (six times on the left and five times on the right), notwithstanding that of the fifty cases, twenty-eight involved the right side.

With the undisputed irregularity in the

course of the sinus and the consequent danger of injuring the vein during a mastoid operation confronting us, the question naturally presents itself whether the danger of injuring the vein during operation could in any way be diminished.

It has been proven conclusively that external measurements are uncertain in determining the position of the sinus and hence are of no practical value.

It seems that the only aid we have in determining the site of the vein is the study of the conformation and make-up of the mastoid bone. The assertion of Politzer that the strongly developed mastoid filled with pneumatic spaces is less apt to be injured than the diploeic or compact bone, has been borne out by most operators. It has been pointed out by Politzer that the prominent wide bone is usually of the pneumatic variety and the flat variety of the compact or diploeic, yet there are exceptions to this, so that the shape of the bone externally can only be looked upon as a suggestion of where the vein is situated.

Beck, Iglauer and others have made use of the X-ray in determining the nature of the bone texture and based upon the knowledge that the vein is farther away from the antrum in the pneumatic bone, have been able to conclude with some degree of certainty the site of the vein.

However, owing to the masked anatomical relations on the affected side through the presence of pus in the bone, the method has a practical application only in an indirect way by revealing the nature of the bone on the unaffected side and necessitating the assumption that similar conditions exist on the diseased side.

Mosher's transillumination serves a similar purpose as the X-ray, but has the same objection of having to be employed on the unaffected side and assuming like relations on the diseased side. It would seem that none of these methods offer the operator much aid in the performance of the mastoid operation. In the absence of practical guides to the location of the sinus the surgeon must ever bear in mind that the vein bears an important relation to the mastoid bone, and that it is subject to great variation in its course. The bone should ever be opened cautiously by following closely the posterior wall of the ear canal and removing bony spiculae and necrotic areas carefully.

DISCUSSION.

Homer Dupuy, New Orleans—This is a splendid contribution. Relative to the proximity of the lateral sinus to the antrum when the sinus is situated so close to this cavity that it actually forms a part of the antrum, I cannot recall seeing a case in which this variation in the course of the sinus presented itself. In regard to the dehiscences, the practical point in the differentiation between a dehiscence due to some anatomical variation and one the result of pathological changes, if a sinus is exposed the whole length of its course in the mastoid process, there being concommitant pathological changes in the mastoid, I would regard this exposure as the result of the morbid process. My observations allow me to draw the following conclusions with regard to the position of the sinus: A superficial sinus is usually one situated close to the meatus; a sinus close to the meatus usually means a highly situated antrum. No structure of the mastoid is so variable in its course and position as the lateral sinus.

Horace T. Aynsworth, Waco, Tex.—I think in reporting anomalies of the mastoid there are some very valuable lessons to be learned. I think in a practical application we learn from Dr. Pfingst's paper that in these cases we can expose the lateral sinus and the adjacent dura with impunity in our operations. It also teaches us we have to be expecting these conditions. In my own practice and teaching I think I have seen all these conditions. I feel justified in exposing the lateral sinus. One winter over half our cases were complicated with perisinus abscess. They were more in the middle portion, with a fair amount of space in between. I do not think there is any danger in exposing the dura in these cases. I think we should not hesitate to sacrifice the posterior wall even in the simple mastoid. In my opinion, there can be no harm in removing the posterior wall; in that way you keep well forward of the lateral sinus at all times.

There is another point; that is, as to the external shape of the mastoid process. Very often we can indicate by superficial examination of the mastoid the position of the lateral sinus. I have tried to figure it out in the dissecting room. The shape in a great many cases is fairly accurately indicated by a prominent ridge running along the course of the mastoid in the position the doctor indicated in his blue prints. The fact remains, if a man is a careful operator and uses his probe, there is little danger of injuring the sinus.

W. Likely Simpson, Memphis, Tenn.—I enjoyed

the paper very much. It brings out some very important points and is certainly very instructive.

About the relation of the sinus to the antrum, I would like to say a few words. I have had a radical operation just lately in which the sinus was so far forward and upward that there was practically no antrum present. It was a chronic suppuration so that it had to be operated.

I would like to mention another case in which, as the periosteum was removed from the mastoid, the blue tinge of the sinus could be definitely made out through the normal bone. After the bone was removed, the above statement was verified. It was in a patient about 40 years old. I think one should always operate so that one could not possibly cut the lateral sinus. We all know that we should not point a chisel so that it could cut the lateral sinus even though it uncovered it. One should use the same care also with curettes right along this line. It seems to me the relation of the lateral sinus to the antrum is very interesting, especially when the lateral sinus is far forward and high up. When one has to do the labrynth operation, this condition is one of the greatest difficulties. At times in doing the labrynth operation, the lateral sinus has to be uncovered and held back with a spatula so the labrynth operation can be finished.

Another little point: In very many of these lateral sinus thromboses and ligation of the vein there is a choked disc present, which is probably an obstruction. This is present in a large majority of the cases in which the jugular is tied or where there is a lateral sinus thrombosis.

A. S. Bird—I think the section is indebted to Dr. Pfingst for this paper and this demonstration. The most important point to me is that it impresses the necessity of working on each case for itself and not by any general rule. That has been my plan in working. In Chicago I had the pleasure of seeing a good man operate. He removed the entire mastoid before he opened the antrum.

J. I. Dowling, Albany, N. Y.—The general surgeon is very apt to do it along that line. I have not seen the special surgeon do it that way.

Adolph Pfingst, Louisville, Ky. (closing)—I did not wish to create the impression that the sinus lies against the antrum frequently as it did in these cases, for I realize that I had a peculiar run of such cases.

These cases reported were taken from fifty mastoid operations seen in the last three years, and, as you have seen, the sinus was bare and against the antrum four times and separated from it by a small layer of necrotic bone in five cases. The two cases with the vein forward in the second part of its course presented nothing unusual.

The point made by Dr. Aynesworth regarding the conformation of the mastoid process externally in determining the location of the sigmoid sinus is of some value, for we know that in the large, high mastoid the sinus is usually far back, and in the low, flat bones that it is close to the sinus and ear canal.

There is one other point; that is, that the sinus sometimes comes over the antrum; that is, between the antrum and the cortex. In such cases the operator, in approaching the sinus through Macewen's triangle, would strike the sinus before reaching the antrum. I have never seen a case with such anatomical conditions.

I thank you for the attention and for the discussion.

RUPTURE OF THE UTERUS.*

By WALTER W. CRAWFORD, M.D.,
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Rupture of the uterus may occur prior to the normal termination of pregnancy or during labor. This brief paper concerns itself only with rupture during labor.

Statistics compiled from many sources indicate a marked variation in the incidence of this most tragic complication in different locations. The New York Lying-in Hospital, with a total of more than sixty thousand cases of labor, had up to 1909, the date last published statistics, forty-six cases of complete rupture, with a maternal mortality of 74 per cent, and foetal mortality of 83 per cent. Or an average of one case to thirteen hundred labors. The Glasgow Maternity in more than ten thousand labors averaged one to each 783 cases of labor. The same maternity reports two cases out of more than forty thousand out patients. Total cases for more than fifty thousand of out and indoor patients combined give an average of one to each 3,420 labors.

Jardine says it occurs once in each four thousand cases labor. Other authorities vary in their estimate from one to one thousand to one to five thousand. The thirty physicians in my city have had approximately eight thousand cases of labor. One of them, Dr. Donald, saw a case in his practice a number of years ago that resulted fatally. The average, therefore, for our immediate locality, has been one case to eight thousand labors.

TYPES: 1. INCOMPLETE. 2. COMPLETE.

The former, though reported less frequently, in all probability occurs many times without recognition, and affords an explanation

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for obscure cases of shock, sepsis and protracted convalescence that are encountered in a reasonably large percentage of labors. We operated on a case last Wednesday that illustrates that feature. Five years ago, during first labor patient had a bad laceration of cervix, with profuse hemorrhage, followed by septic fever that kept her in bed for more than six weeks. Patient has had four subsequent pregnancies, each of which resulted in

Laceration extended to cross.

an abortion. On examination we found that cervix had been lacerated bilaterally beyond internal os, and that the laceration had involved the left vaginal fornix as evidenced by the scar.

Complete rupture is attended with such a classic symptom complex that it should be readily recognized.

Rupture occurs more frequently in multipara than in primapara, the ratio being about five to one. This increase is supposed and probably is due to impaired health and lack of muscular tone in women who have borne other children. In our recent case that was undoubtedly true.

Lobenstine in the September, 1909, number of Bulletin of the New York Lying-in Hospital, gives such an excellent classification of the etiologic factors in rupture that I shall take the liberty of quoting him in full.

He gives the causes under three general headings:

1. Conditions due to the uterus.

(a) Uterine scars due to Caesarean section; old incomplete lacertions of cervix or lower zone.

(b) Prolonged dry labor.

(c) Tumors of the uterus.

(d) Fixation operations of the uterus.

(e) Anomalies as uterus duplex and unicornis.

(f) Degeneration of uterine muscalature; abnormal imbedding of chronic villi.

(g) Congenital hyperplasia of uterus.
(h) Congenital or acquired stenosis of cervix.
2. Conditions due to child:
(a) Congenital anomalies, as hydrocephalus and other monstrosities.
(b) Abnormal presentation of fetus, especially tranverse presentations.
3. Conditions due to pelvis:
(a) Pelvic contractions.
(b) New growths originating in any of the pelvic organs or in pelvic girdle.

Rupture of uterus may be transverse, involving either the anterior or posterior wall, or it may be longitudinal. In either case, it usually involves the lower uterine segment on account of the fact that the wall is thinner in that portion, and the further fact that pressure of the presenting part has a tendency to paralyze the muscular fibers of the uterus at that point, and thereby destroy their resistance and contractility.

SYMPTOMS.

Ordinarily, rupture comes as a crisis in a labor hard and protracted. Patient has a long and very severe pain followed by a tendency to uterine inertia. Collapse that may be immediately manifest or delayed for more than an hour. Pulse becomes rapid, there may be pronounced hemorrhage.

Jardine sums it up in one terse sentence when he says: "The stoppage of the pains, the collapse, the hemorrhage and the recession of the presenting part plainly indicate what has occurred."

PROGNOSIS.

Maternal mortality in untreated cases, according to Edgar, is above 90 per cent; fetal mortality, 95 per cent.

The same author says that modern methods reduce above mortality to 55 to 60 per cent.

Shock, hemorrhage and sepsis are the main sources of death. The location of the rupture materially influences the degree of hemorrhage and tendency to sepsis.

TREATMENT.

In order to obviate this complication the ob-

Notice Bandt's Ring.

stretrician should analyze the various factors that are liable to produce it in any given case, and resort to those measures that will be most helpful in reducing that liability.

Prolonged labors should be avoided when intelligent interference is available. If the pelvis is contracted, the child's head unusually large; if there is a transverse presentation or a tendency to the formation of Bandl's ring, proper manipulation and adjustment should be resorted to without delay.

As we review our past experience and recall our masterful (?) inactivity in the presence of some cases that have been the heritage of most of us is it not marvelous that we have not encountered this extreme more frequently?

Having made a diagnosis of rupture the obstetrician, whether the child has already been delivered or not, must render an emergency decision that will largely influence the question of maternal recovery. If the complication is discovered before the foetus is delivered and the presentation is normal, or an easy forceps extraction is possible, it would be well to deliver at once. If a portion of the child has escaped into the abdominal cavity, or if it is a transverse presentation, it would be best to administer a liberal dose of morphine and rush patient to a hospital at once for surgical intervention.

In cases of incomplete rupture the vagina and uterine cavity should be rendered as nearly sterile as possible, and latter should be packed with sterile gauze. Gauze should be removed at the end of forty-eight hours. This, of course, applies only to those cases in which one is positive that the rupture does not involve the peritoneal cavity. If there is even a remote doubt about the extent of damage it is better to make use of the same logic that characterizes our management of cases of gunshot and stab wounds of the abdominal wall with uncertainty as to penetration. Even though the exploratory operation may be found to have been unnecessary it at least places both patient and surgeon on safe grounds.

Some very excellent authorities contend that those cases of complete rupture in which the tear in uterine wall is small may be treated by tamponade, reserving laparotomy for the possible advent of peritonitis. In these days of improved technique and careful asepsis and antisepsis we feel that the patient should not be subjected to the element of risk that the tamponade and postponement plan invites.

Edgar says: "I believe laparotomy to be indicated in all cases of complete rupture, and when there is serious hemorrhage from incomplete rupture."

Williams says: "I believe the best results will follow laparatomy, no matter what the extent of the tear or whether the patient is suffering from hemorrhage or not, for the reason that it is ofttimes difficult to determine the extent of laceration, and it is absolutely impossible to foretell whether the hemorrhage can be checked by simple measures."

If laceration of uterine wall is small it should be closed in tier sutures just as in Caesarean section. If laceration is large either a complete, or, in most cases, supra-vaginal hysterectomy should be done. The question of removal of uterus should be determined by extent of tear, condition of uterine musculature and probability of sepsis. Radical operation is always indicated where there is degeneration of tissues of uterus or presumptive evidence of sepsis.

Post-operative treatment of these cases is not unlike that for ordinary hysterectomy except that one is dealing with a more extreme situation and must make more liberal and protracted use of hypodermoclysis.

On September 1, Dr. Brown, of Sumrall, Miss., attended a case of obstetrics that he later brought to us with the following history:

Mrs. W., age 35, mother of nine children, all dead except two.

First child died at age of 12 with scarlet fever.

Second child died at age of 10 months with cholera infantum.

Third child died at age of 6 hours. Mother had measles at that time.

Fourth and fifth twins. One died from com-

pression of cord, other died at three months from pneumonia.

Sixth is 8 years old and in good health.

Seventh is 6 years old and in good health.

Eighth died at 2½ years of cholera infantum.

Ninth stillborn as result of rupture of uterus in case under consideration.

Patient has always had good health until last pregnancy. During past few months has had almost constant pain in lower part of abdomen.

Labors in past have been easy, none of them lasting over six hours.

At 7 a. m., September 1, labor began; pains were very mild until 9:30. At 10, Dr. Brown was summoned. He arrived a few minutes later, made an examination and found a normal presentation. Membranes ruptured and dilatation was progressing in a very satisfactory manner, when at 11:30 patient experienced one long and excrutiating pain that was promptly followed by uterine inertia. Symptoms of shock were soon manifest. A diagnosis of rupture of uterus was made and patient was brought to South Mississippi Infirmary on first train, which was at 8, more than eight hours after occurrence of accident. On admission patient had pulse of about 140 and other manifestations of shock. Vaginal examination revealed a normal presentation. A moderately contracted uterus was readily palpable. Feet and legs of child could be felt lying in a transverse position above uterus. Body of child was to the right of body of uterus. The question of electing to remove child by forceps, or through abdominal incision was decided in favor of the latter because we felt that time and shock elements would be minimized. Therefore a hasty preparation of vulva, unoccupied portion of vagina and abdominal wall with tincture of iodine was made. Liberal central incision. Abdominal cavity was filled with blood clots and child weighing nine pounds was delivered. The longitudinal rent in uterus in line with the insertion with right broad ligament was so large, in spite of fair contraction, that it was quite easy to extract the head, the body having already escaped. Child had apparently been dead several hours. A large hematoma beneath peritoneum extended from rent in uterus to lower pole of right kidney. A severe hemorrhage had evidently occurred beneath peritoneum before the cavity was opened. The ureter had been dissected upward with the peritoneum throughout its entire course.

The laceration in uterus extended from lip of cervix several inches into the body of uterus.

There was a mass of jelly-like material surrounding the lower uterine segment. Musculature showed evidence of degeneration. Supra vaginal hysterectomy was done and vaginal drain inserted. Time of operation fifty minutes.

Patient's condition was so bad that a continuous hypodermoclysis was required during operation, and this procedure had to be repeated every four hours for several days after operation. Pulse ranged from 120 to 130 during first week. Patient was discharged at end of three weeks.

Inasmuch as I did not see this patient prior to rupture it was, of course, not possible for me to have known under ordinary circumstances what was the exciting cause of this accident, but you will observe that nature has labeled it. The distinct ring across uterus extending, as it does, from broad ligament to broad liagement, is undoubtedely Bandl's ring.

DISCUSSION.

Dr. Louis Frank, Louisville, Ky.—I have had no experience with rupture of the uterus occurring during labor. I think you cannot judge from the statistics of hospitals like the Lying-in Hospital of New York and other hospitals of like character as to the frequency of the accident. You must take into consideration the character of the people who are patients in such institutions and the places from which they come, and you would then hardly apply their statistics to the cases which come in the family practitioner's care.

The New York Lying-in Hospital, where occurs the largest experience in operations of Caesarean section, and other operative work of this class, are notoriously filled with people among whom are a tremendous number with pelvic deformities, and we would expect to find this class of accidents very frequently.

Another point which I asked myself when the doctor read the paper is how an obstetrician is to diagnose an impending rupture of the uterus. From the limited experience which I have had in obstetrics I must confess I know of no way in which an obstetrician would be able to anticipate such an accident and do his operation or whatever he might find necessary primarily, especially when he takes into consideration that the patient may not have had a long labor. Of course we know in days gone by when fixation of the uterus was extensively practiced for retroversion this might have occurred, but in any given case are we justifiable in subjecting a women to a major operation of this sort for fear that the uterus may rupture during labor?

Another thing that struck me: Too much surgery is sometimes done. Of course the man on the field must be the judge, but from our experience in Caesarean section it seems to me in many instances instead of doing a hysterectomy and consuming a great amount of time, which we know is an important factor in the recovery of the patient, we might be satisfied with suturing the rupture in the uterus primarily. It seems

in ordinary cases the patient should get well as easily as when Caesarean section is performed.

Dr. J. W. Brandau, Clarksville, Tenn.—A doctor (the late Dr. Elliott, of Port Royal) telephoned me in the night. He had a patient, a lady about 35 years of age, in very violent labor. Upon examination he found a vertex presentation. The pains were unusually severe, but after a couple of hours suddenly ceased. He then made another digital examination and found the head had disappeared. He telephoned me the symptoms, and the first thing that occurred to me was a ruptured uterus. I drove out as quickly as possible, twelve miles. We quickly opened the abdomen and removed the child with the placenta and round a large quantity of blood in the abdominal cavity. We found the left lower segment of the uterus ruptured. That was sutured with catgut and the abdominal incision closed. The patient was so profoundly shocked that she died in two or three hours after operation.

Dr. H. P. Linsz, Wheeling, W. Va.—I do not consider statistics, of which the doctor speaks, play a very important part as a criterion in this class of cases. A young practitioner reported a case of ruptured uterus out of the first four cases of obstetrics he had had in which the only symptom he had to go by was the sudden cessation of pains, that the baby appeared to float about in the abdominal cavity, and could be moved about in all directions. In this case there was no necessity for doing a hysterectomy at all. A Caesareason section was performed and the patient recovered. This is the only case that has come under my observation.

Dr. Crawford closes—Of course, we all know the unreliability of statistics, but after all one undoubtedly acquires relative information from that source that is worth much to him. Glasgow showed maternity statistics that out of 10,000 cases, indoor patients, they had a very much higher percentage than among those cases that were attended from the infirmary on the outside. Only one out of each 20,000 occurred in their out-patient service, whereas, the cases that occurred within the institution were one out of each 750 cases.

Now, all of these institutions, in giving statistics, call attention to the fact that they get the bad cases. In a certain per cent of these cases that are brought to the institution, rupture has taken place already, and in others they anticipate trouble.

THE ETHICS OF SEX, OR A PLAIN TALK ON EUGENICS.*

By Lee Alexander Stone, M.D.,
Memphis, Tenn.

Ladies and Gentlemen, and Members of the Southern Medical Association: When I was invited to read a paper before you on the subject of Eugenics I began to look around and try to fix in my mind a line of argument that would appeal to a mixed audience. I have chosen to talk to you on "The Ethics of Sex," and attempt to explain just what the term Eugenics implies.

Eugenics is a science which teaches people of all races how to best improve generations that are to come, and to develop a higher state of mental and physical perfection among all nations by teaching better methods of breeding. It has seemed to me that to talk in scientific terms would be useless, and for that reason I have deemed it proper to discuss my subject in popular form.

I wish to say that I propose to speak very plainly and not mince my words, and your presence here today is sufficient guarantee to me that you are interested; therefore I shall proceed without any further apology.

This paper will not deal with the subject of eugenics *per se,* but with the subject that will produce more than anything else, the perfect child of the future. That subject is marriage. The perfect mating of two beings of opposite sex in holy wedlock will produce the perfect man and woman of the future, and in this manner a higher civilization will be developed.

I hold that without the existence of love it will be impossible for perfect beings to be born. The perfectly mated pair, who are at all times in perfect accord with one another and in whose thoughts centers a desire to bring into the world beings like unto themselves who will excel them, are the ones the world is looking toward to produce the great men and women of the future.

Here is a definition of marriage that should impress itself on your minds: Marriage; the blending of two souls together to make more perfect the future soul of one who is to be born, is the object that nature had in mind when she gave the world beings of opposite sex.

Heredity, of course, plays a big part in the

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developing of the lives of children, and the influences of heredity and eugenics are a part of one another. It is to be hoped that in the near future, when there can be eliminated by sterilization, the unfit from society, thereby preventing men and women, because of their unfitness, from becoming parents of children, who would only follow in their footsteps, that a perfect line of ancestors may be established and viewed with pride. Toward the last of this paper I will attempt to indicate in a small way the advantages to be gained by the sterilization of the unfit.

Havelock Ellis has this to say about the perfecting of the race in the future: "Human breeding must proceed from impulses that arise, voluntarily, in human brains and wills, and are carried out with a human sense of personal responsibility." He also says that "Eugenics constitutes the link between the social reform of the past, painfully struggling to improve the conditions of life, and the social hygiene of the future, which is authorized to deal adequately with the conditions of life because it has its hands on the sources of life."

Professor Charles B. Davenport, who, perhaps, has done more work along eugenic lines than any other American, has this to say regarding the general program of the eugenist: "The general program of the eugenist is clear—it is to improve the race by inducing young people to make a more reasonable selection of marriage mates, to fall in love intelligently. It also includes the control by the state of the propagation of the mentally incompetent. It does not imply destruction of the unfit either before or after birth. It certainly has only disgust for the free love propaganda that some ill-balanced persons have sought to attach to the name. Rather it trusts to that good sense with which the majority of people are possessed, and believes that in the life of such there comes a time when they realize that they are drifting toward marriage and stop to consider if the contemplated union will result in healthful, mentally well-endowed offspring. At present there are few facts so generally known that they will help such persons in their inquiry. It is the province of the new science of eugenics to study the laws of inheritance of human traits and, as these laws are ascertained, to make them known. There is no doubt that when such laws are clearly formulated many certainly unfit matings will be avoided and other fit matings that have been shunned through false scruples will be happily contracted."

How often in the lives of men and women does the question of the actual meaning of life and its reproduction prove a stumbling block in their path? Why, through all the ages, has ignorance with regard to self been permitted to exist? Why is it that anything that is born with and remains as a part of one's being, such as the sex impulse, should be looked upon as unclean? Are not the results of the sex impulse, children, enough to raise it to a pinnacle of worship rather than lower it to a bottomless pit of abuse and iniquity?

All life, all questions, whether they pertain to the state or to the church, whether they are questions of economics, politics, science or religion, are solely dependent on the sex impulse to create beings who will carry out for all time to come the basic principles and teachings of each.

When woman at the beginning of the Christian era became a servile and cringing creature, always ready to take any burden or abuse her lord and master chose to inflict upon her; when her sex became a thing apart from and an unclean factor in the eyes of the law, so-called modesty and prudery were born. She was made to hide her charms and became the victim, not of monogamy, but of brutish and cruel systems built up by priests who were in absolute power. She was regarded as being fit only, like a female animal, to reproduce her kind, and serve as a bond servant to grant any whim or fancy her male superior chose to demand of her. As a consequence of this

idea, which, unfortunately, predominates to a very large degree today, women have been viewed as being creatures of mediocre intelligence and only fit for reproduction and sexual and sensual gratification.

Prior to this time the sex impulse was regarded as being holy, and nothing was known of modesty or prudery; that is, in the sense in which these terms are understood today. Men and women worshipped at the shrine of purity, both in thought and mind, and to regard the holy functions of reproduction as being unclean or indecent never occurred to them. Their sole idea was to worship man and what man could produce as the result of his mental or physical ability. They were in every respect idealists, and never allowed the profane or impure to influence them or their actions.

It is very true that commercialized prostitution had been in existence for centuries before the Christian era, but, even though this was a fact, prostitutes were able to command a certain respect. A close study of ancient prostitution will reveal to the student a condition very different from that which exists at the present time.

It will be my purpose to discuss what will follow in as plain language as possible, without offending, I hope, the delicate sensibilities of the audience before me or of the great mass of the people who have been surrounded for so long by an environment that forbade even the mention of sexual matters. "The Ethics of Sex." I expect to shock some because of my very plain talk, but feel assured that, after the effects of the shock have worn off, an entirely different view in the minds of my hearers as to what constitutes modesty and prudery will develop. It is absolutely necessary to shock some people before they can be brought to realize that the time for their awakening is at hand, and that, if they would develop, they must lay aside tradition and the hothouse environment in which they have been brought up and change their views or drop back into the ruts which have been made by the establishment of false standards of morals.

It is necessary in discussing "The Ethics of Sex" to speak plainly and not through a veil of meaningless words and phrases. It is also necessary to be brief and say in as few words as possible all that may be said at present regarding the normal and healthy relations occurring between man and his mate. It is not the province of this paper to discuss pathological or abnormal conditions. A discussion of this nature belongs entirely in the realms of science. Perversions and abnormalities are so infrequent in their occurrence as to have no place in the literature of the reader who is reading merely for personal instruction and not for scientific advancement.

"Without the existence of the sexual desire, and the act which gratifies it, the human race would become exterminated. Procreation would be impossible. All ambition, endeavor and affection, all poetry, art and religion—in short, all the emotions and achievements inspired by love, would cease, and the people of the world would become cold and passionless."*

The vast majority of men and women are blind to the importance of the sexual nature in its relation to the affairs of the world. They fail to realize that, except for it, they would not exist, and that the wellspring of happiness and human life would dry up, and that the foundations of society would be destroyed.

Love is nothing more than a manifestation of the sexual instinct, and the sexual instinct is the animating impulse of all organic life.

Men and women are reluctant to admit the existence of sexual desire when wooing, and would blush at its mention and deny its existence. Yet, at the same time, the desire is there, to be gratified after the law has made them husband and wife.

The teachings of God, as recognized by all theologians and men of learning, as bearing on procreation of the species, declare that the

* "Sex Worship," Howard.

existence of the sexual desire is necessary, and that procreation, or transmission of life from one generation to another, follows the gratification of that desire.

The begetting of children has been the holiest aim in life since the dawn of creation. For a woman to be barren and bear no children was regarded as worse than death. The Jews believed a curse had been put upon her. Fear of dying without issue led their women sometimes to resort to subterfuges and impositions; hence Lot's daughters committed incest with their father while dwelling in their secluded abode in the mountains, "because there is not a man in all the earth to come in unto us." Gen. 19. The begetting of children was the highest aim in their lives, and, after they were secluded in the mountains the fear of barrenness came upon them, so that they resorted to subterfuge and deceit to bring into the world beings like unto themselves, and thus obey the will of the Almighty.

The creative act is man's incomparably greatest pleasure, and produces the most wonderful and prized result—a new being like himself.

It was on account of this act, and what it produced, that man in primitive days worshipped the male organ of generation as a god. The phallus was regarded as the incarnate source of being, as the embodiment of the power on the part of man to create a new being. Therefore it was looked upon as the Author of Life, and worshipped as such.

This holy reverence for the organs of generation is exemplified in the book of Deuteronomy, where Jehovah himself ordained: "He that is wounded in the stones, or hath his privy member cut off, shall not enter into the congregation of the Lord." Deut. 23:1. The manner of administering an oath among the ancient Hebrews was by placing the right hand between the thighs of the male, upon the genital organs—exactly as today we require one taking an oath to place his hand upon the Holy Bible—and for the same reason, because these were regarded by them, as we regard the Bible now, as the most sacred of tangible things.

Reverence for the perfect man is not confined to the past, for at the present day one who is mutilated sexually is not considered "a man," and cannot be consecrated as a priest.

Castration has always been regarded as a punishment worse than death—a fate that degraded man below the level of the lowest and meanest brute.

The songs of Solomon are replete with the beauties of life as obtained by the gratification of sexual desire. They are full of the poetry of excessive delight over those things which go toward making the union between man and woman perfect. Especially is Chapter VII filled with the genuineness of true love, as exemplified in a perfectly mated pair.

The "Divine Act" is a natural one, and should be looked upon as such and not classed among the hidden and unclean things of life. The false structure of prudery should be torn down, and strong, clean views of life brought forward, and a temple built to common sense.

Unfortunately, in the past no difference has been made between the terms sexual and sensual, and sexual matters have always been associated with the sensual and unclean. As has been said before, the sexual relation is the most sacred relation occurring between man and woman united in holy wedlock. Sexual matters can only reach their climax when there exists that sublime something which is born when beings of opposite sex are in perfect accord with each other, and feel that there can be no happiness for them unless they become husband and wife. Love is the term applied to this feeling, and, without love, there is no chance for aught but the sensual to exist.

Women frequently submit to men in the sexual embrace when their whole being revolts, yet, because of a desire to keep peace and avoid friction, they are willing to do most anything. A man who will use brute force

or unkind words to obtain sexual gratification from his wife, is no better than a brute. He should try by kindness and love to bring her to the point where he will not have to insist, but will only have to express a desire to have his wishes granted. No woman likes to be forced into the performance of an act that is repugnant to her on account of the brutal behavior of her spouse any more than a man likes to be forced against his will to do that which is repugnant to him.

Love has an element of spirituality which, when it takes hold of one's inner self, develops it to a stage of perfection that would be unattainable without it. In other words, man and woman must first learn how to love before they can hope to reach the pinnacle on which happiness is located, and where the highest degree of marital felicity may be enjoyed.

The holiest aim in the life of any woman should be that of motherhood. No grander privilege was ever granted a being. To be able to reproduce her kind and watch it develop mentally and physically is the grandest prerogative granted by nature. Nothing surpasses it. The nearest approach to the sight of the Deity one ever has is when he or she looks into the face of the mother of a newborn babe. The mother's face is radiant with beauty and spirituality, and fills one full of a feeling of awe and respect. Her countenance is one that artists never have been able to copy, because it approaches the etherial and spiritual so closely as to be beyond them.

The woman who is blessed with the love of a good man, one who watches over her and cares for her gently and makes of her his ideal to be carried everywhere he goes, should be happy beyond the expression of words. During the dark days of pregnancy, and there are many of them, she needs the reassuring presence of her husband and his love. She wants to feel that he at all times is willing to be patient with her. She wants to know that her burdens are his, and that he is ever ready to do anything he can towards comforting her.

The great Nietzche has given perhaps the best definition of marriage that has ever been written: "Marriage; so named, the will of two to call into existence one, who is more than they who called him into existence." Where can there be found a nobler conception? To be able to bring into existence a being who, if brought up properly and in the proper environment, will amount to more than they who brought him into existence, should make all men and women pause and view with greater respect the institutions of marriage and parenthood.

Marriage is the Rock of Gibraltar of our social structure. By its bonds marriage has more than once held nations together. Marriage is the promoter of happiness and bliss, the promoter of the greatest institution of all times—the home, and for these reasons will continue as an institution as long as time lasts.

In order to properly preserve the race and the strength of the bodies and minds of beings born every day, it is necessary that the sexual power be held in reserve and used only at the proper time, the proper time being after the law has united man and woman as husband and wife.

The wasting of sexual energy by illicit communion is likely to weaken man's procreative ability and his chance to be the father of strong and healthy children. The organs of generation are given in order that men and women may become the fathers and mothers of beings like unto themselves. The procreative organs of the male and the female may be likened to great laboratories wherein life is first originated or begun; where materials are joined together for the purpose of making a human being. It is necessary that the materials gathered together in these laboratories be properly mixed, hence nature has provided the Fallopian Tube in the woman, where the spermatozoa, or seed of the male and the ovum, or the egg of the female, may meet and

by close contact become a part of one another. This contact results in a new body that begins to grow by cell division. This body remains for a little while in the Fallopian tube, until nature, through the little hair-like processes which line the tube, forces it out into the uterus or womb, where it grows more rapidly, and finally develops into an embryonic being, which, after remaining in the uterus for 270 or 280 days, is born into the world a boy or girl.

Marriage is more than an institution wherein two souls are joined together; it is the linking together for life of men and women for the procreating or bringing into the world races to come. It is the right of these races to come to be well born. It is their right that they should be able to boast of the strength of their ancestry, and that they should come into the world strong in mind and body.

There comes up, of course, many times the question of the advisability of some men and women being allowed to procreate. There are, of course, extenuating circumstances wherein motherhood is not advisable, as, for example, where it is known that there is a taint on either the husband's or the wife's side that would militate against their offspring, as insanity, epilepsy, etc., in their line of ancestry, or where the husband himself is a weakling and the victim of drink or some other pernicious habit or disease that saps his vitality. Syphilis, either acquired or hereditary, should at all times cause women to prevent conception. In fact, anything which would have a tendency to weaken her offspring makes it justifiable for the wife to prevent conception.

It has been suggested by some that, in order to perfect the coming races, it will be necessary to destroy the procreative ability of men and women, who, because of degeneracy of one kind or another, either physical or mental, are rendered unfit to have children. Havelock Ellis says: "The most vital problem before our civilization today is the question of motherhood, the question of creating human beings best fitted for modern life."

When that time comes in our civilization, when men and women before they marry will carefully investigate all that may be known of the lives of each other, with the view of reaching a perfect union, then will be born as a result of that union the perfect man. Then will the dream of eugenists come true, and a finer and truer philosophy of life be born.

There is no doubt that children born of happy parents, parents who actually enjoy the conjugal act, are the strongest physically and mentally.

The act of begetting children is God-given, and should be viewed as such. It is also a natural act, and should be performed with a view of obtaining the best results.

I have talked to a great many men and women, and believe that if husbands and wives would perform the marriage relation properly, there would be an increased desire on the part of the wives for more children.

Men and women marry every day who have not the least idea as to the proper manner of performing the marriage act. They know that the result of the union by law is the consummation of this act, and instinctively find a method of performing it. As to how to gain the best results from their sexual life, they are in ignorance. They have been taught that to mention it is vulgar, and that only the low and sensually minded ever discuss its performance with others. For this reason they allow themselves to remain ignorant.

I venture the assertion that if the actual cause of the divorce evil could be ferreted out it would be found that, in the majority of cases, the man and woman were ill-mated sexually. This would not be true if the sexual relations were better understood.

That eugenics will, as popularly supposed, destroy love because of its being a science, is not a fact. A greater love will develop from the mating of beings best fitted to perfect the oncoming races on whom the development of a higher civilization will depend. Love has

always stood for those things that were truest, and has tried throughout all the ages that have gone to make perfect the union between man and woman in order that grander men and women might exist in the future. I would make ideal love the very culmination of fitness for parenthood. No child can be well born that is the product of a loveless marriage. Look around you and see the results of loveless marriage, see the unhappy and mentally deficient children that are everywhere present in our society today.

The child, the sexless being of today, will be the man or the woman of tomorrow, possessed of an ability to procreate the species. Do you want these children to grow up with the idea that they are nothing more than pieces of machinery, and the slaves of tradition and superstition? Would you not rather that they should be taught the mysteries of self and grow up with a higher purpose in mind, with a greater respect for those things that nature has ordained shall happen? I would that it were possible for me to draw a picture so vivid of the fruits of ignorance, tradition, provincialism and superstition as to stagger your intelligence and force you from your present seat of complacency and make you vow from this very hour to destroy all the fruits of the iniquity of ignorance—for, my friends, ignorance is the greatest iniquity of all, and is too apparent to be allowed to exist.

The time will come when, instead of two standards of morality, one for the man and one for the woman, there will be only one, and that one will be built on broad lines; built on charity and justice; built so that man and woman shall expect of both sexes that same degree of chastity which they now expect of woman alone.

There is a crying need for plain talk at the present moment; talk that will drive home facts about which there has already been so much said and more written by speakers and authors who have feared to use plain language —and who have so veiled their remarks as to render their meaning very obscure, and for that reason never accomplishing the results they had hoped to. A discussion of the evils resulting from the illicit communion of a man with an unfortunate creature of the underworld is apropos at this time. The chances are that he will contract some loathsome disease, gonorrhoea or syphilis, for example. Some writers claim that neither one of these diseases has ever been cured, which is a mistake, although the most rigid medication is required.

There seems to be a sentence of silence imposed upon the young, and a concerted effort to conceal all knowledge—a very conspiracy of silence. The individual is kept in ignorance of the dangers of gonorrhoea, and even the medical profession, sad to relate, have not in the past paid the attention they should to the treatment and elimination of it. They have rather laughed at the patient, and told him he could be cured without any trouble—instead of impressing him with the importance of proper treatment, and the prospect of his future infection of the innocent unless he submitted to rigid medication.

If the diseases produced by illicit intercourse could be confined to the guilty, only they would suffer, and they alone would have to bear the horrible consequences of their debauchery. Alas for mankind! such is not the case, for these same debauched creatures frequently marry good women, who are chaste and pure as the driven snow, only to convey to them the horrible consequences of diseases contracted as the result of the sowing of their "wild oats." Many a man has thus made an invalid of his wife who, if she had married an untainted man, would have enjoyed the pleasures of good health.

The wife is not the only sufferer. Her children are likely to be born blind as the result of gonorrhoea, or born with some loathsome marking or disease, or weakened mentality, so that they become idiotic as a consequence of syphilitic infection. The results of syphilis may show in each child born for years

after the initial infection of their ancestor—for its horrors last throughout many generations.

Dr. Charles W. Eliot, President Emeritus of Harvard University, has said: "Chastity in man in just as necessary as chastity in woman, for the security, honor and happiness of family life; continence is absolutely healthy for both sexes; men's profligacy is the cause or source of women's prostitution with its awful consequences to the guilty parties and to the innocent human beings who are later infected by the guilty; the most precious joys and most durable satisfactions of life are put at a fearful risk by sexual immorality."

Man should not expect more from the woman he loves and makes his bride than he is willing and ready to give in return. The days of the sowing of "wild oats" are passing. The time is approaching when a girl or woman will look with scorn on a proposal of marriage from a profligate whose boasts to his friends is that he has had mistresses without number, and that he has no desire to associate with a girl unless she allows liberties and is loose in her moral behavior.

It is an unfortunate fact that there are many men living today whose chief boast is that they have debauched innocent girls. There is many a girl who, but for such creatures, would never have taken the drink (given with fell design by one of these moral perverts) which caused her to lose control of self and yield up her priceless chastity and become an outcast from society and a nameless creature of the brothel.

Woman should demand the same pure life on the part of her lover that he demands of her. The moment she finds that he will not measure up to this standard she should shun his company as though he were an adder about to spring upon her; for, more fearful than the adder whose poison kills at once, he is capable of infecting her with a poison so subtle in its action that it does not produce immediate death but long and untold suffering.

The man who, in the future, can boast of a clean life, and of the fact that he has never violated the laws of chastity, and who goes to the woman he marries as pure and undefiled as she, will wear the priceless jewel of true manhood.

We are learning every day more about ourselves than we ever knew before. We have learned that the gratification of sexual desire is not necessary to health, and that man may refrain from the performance of it until after he is married without in any way injuring his virility or strength in after years.

The procreative organs are very delicate, and require very careful handling in order that perfection may be attained.

The best way to attain purity and cleanliness of mind is by education, and it is absolutely necessary that the young be educated in matters pertaining to sex if they are to be expected to climb to the heights of the highest civilization attainable and there develop not only themselves but others.

The proper education of children will bring joy and happiness to them in their future lives. Children should be educated up to the idea that to indulge in the sexual relation before marriage might forever bar them from decent society and the chance of marriage. The home should be a school wherein the lessons of life are taught the young in order that when sent out into the world to do for themselves it will be easier for them to withstand temptation than it would have been had they not been the recipients of such liberal education.

It is a most lamentable fact that today in the majority of states a lewd, disease-ridden profligate, showing in his every look and in his general appearance just what he is, may go to any county court clerk and obtain a marriage license to marry a woman who is not only pure as the driven snow, but strong and healthy as well.

There are no questions asked, even though the clerk issuing the license may know perfectly the character of the man with whom he is dealing, yet, on account of our present laws,

he is powerless to act and must issue a license, knowing that marriage will be the means of causing great suffering and untold agony in the woman for years to come until she is finally relieved by the kind hand of death.

What can be expected of laws that compel a man to grant a license to a creature like the one just mentioned? Is it a wonder that degeneracy and illiteracy exist—that women and children suffer as a result of them?

These laws are made by men who, in a measure, are totally incapable of making anything, but are merely the tools of designing politicians who are only interested in their own behalf and care nothing for the future welfare of the nation.

Breeders of cattle and horses and floriculturists and practical farmers are continually devising means of improving both animal and vegetable life, and do not hesitate to take up hours of time in explaining their methods, yet, when approached and asked for their vote to change the present marriage laws, a change that will benefit the entire human race, they turn away and refuse to listen. If they reply at all, they say that what was good enough for their mothers and fathers is good enough for them. They forget that, instead of standing still, the people of the world are progressing, and that as time advances ancient methods and traditions will be relegated to the archives of the past in order that room may be made for the improvements that will come as a natural result of progressivism.

The day is fast approaching when legislation will be enacted in every state that will enforce marriage laws which will be strict and will have to be obeyed to their very letter. Before a marriage license is issued, both contracting parties will have to produce certificates of health signed by a board composed of reputable physicians, stating that they are fit physically and mentally to marry and bring up children, and that the man or the woman has never contracted a venereal disease. If he or she has, they will have to submit to another thorough examination by a board composed of physicians, and declared completely cured before the license will be granted.

When the marriage service may be said by any licensed minister, justice of the peace or other official of the law, there is bound to be a certain laxity and a certain carelessness displayed that should not be, and many a man and woman has lived to rue the day they ever saw one another as the result of hasty marriage.

The old method of publishing the "bans" should be brought into use again, and laws passed that would enforce their publishing.

Many a man and woman, if the law enforced a delay, would, after due deliberation, refuse to take the step that ought to mean so much to them.

Many a marriage has taken place when passion has predominated and gotten the better of sane judgment. Such a marriage could not take place if laws were enforced that required a deliberation of, say, thirty days. Again, laws of such a nature would give both the man and the woman a chance to investigate one another, and learn all that was to be known about each other. This alone would frequently cause them to break up an alliance that would only prove harmful to one or the other, and in the end to both.

Men will some day become creatures of morals, and calm, reasoning intellect instead of instinct. The coming of that day will mark a period the like of which has never been seen in history. Morality will prevail, and a complete rebuilding of the social structure will result. The position of the man who leads a pure life will be pre-eminently higher than that of his neighbor who is loose in his morals and leads a life of disgusting sensuality.

Ridding the world of the criminal class and the moral degenerate must come through enforcement of radical measures.

The right of the child to be well born is a problem the world is facing. Eugenists are devising ways and means and giving whole-

some instruction to mothers and fathers as to how to properly care for themselves in order that their children may be born healthy and free from mental or physical blemish. Instruction is being given so that there can be no possible excuse for ignorance. Children are being taught the secrets of life, and are being made to understand that the secrecies of the past regarding themselves are just the things they should know, now that ignorance is being relegated to the ash-heap of mediaeval hypocrisy.

The teacher of eugenics, in his fight for race improvement, has not overlooked the fact that in our midst is an anti-social class to be reckoned with. The hardened criminal, the moral degenerate, the mentally deficient, the hopelessly insane, the beggar class—and they the legion—the prostitute, the pimp, the inebriate, cocaine and morphine fiends, and some others that might be mentioned would time permit—all of these are anti-social beings. There are many of them, and a means must be devised to rid the world of the prospect of their marrying and bringing into the world beings like themselves. In other words, it will be found necessary, if we wish to be rid of all that has a tendency to produce anything that will stop progression and the general upbuilding of the race, to resort to radical measures.

The operation of vasectomy—sterilization—has been suggested as a means of improving future generations that are yet unborn by destroying the procreative ability of those who, by bringing into the world beings like themselves, are doing humanity a very great injustice by continuing the production of undesirable citizens.

This operation will not in any way interfere with marriage, except that the man and the woman will not be able to reproduce their kind. They will be able to enjoy the marriage relation and live together as man and wife with the knowledge that they are not a menace to civilization, and that when they die their race, as far as they are concerned, dies with them. It will be by the process of elimination, and it alone, that the race improvement we are hoping for will come.

The vasectomy operation is a harmless one, and is not castration, and involves no real mutilation and no loss of power beyond that of procreation.

There is a class of people who, unconsciously, are a cause of degeneracy, and frequently the cause of criminality, by arguing to their children when they show a desire to advance and really amount to something in the world, that what was good enough for their fathers and mothers is good enough for them. This is a mistake, and one which should be rectified, for man must either progress today or degenerate into an undesirable citizen.

It must be seen that the men or the women who accomplish things in this age are those who have laid aside traditions and climbed the mountains of difficulties, and have overcome them. They are the ones to be classed as desirable citizens. Those who do not accomplish anything must not be allowed to sap the vitality of the strong by their failures or acts, which put them in a class the world would be better off without.

I hold that every man or woman who belongs to the degenerate class, whether criminal, inebriate, beggar, pimp, prostitute, imbecile, or moral leper, should have their powers of procreation taken from them in order that in the future it may be truthfully said of the children born into the world: "They come from strong and healthy families, and families composed of men and women who have really done something for race improvement."

Some states have passed laws making legal the destruction of the procreative powers of criminals—they have taken a step forward in race progression.

The moment a race of people begins to study means and methods for the improvement of mankind at that moment does that race or nation ascend to heights of civilization that

cannot be approached by those who pay no attention to anything but the fight for the almighty dollar.

The Spartans, through a process of elimination, developed a race of perfect men and women—perfect, not only in body but in intellectual attainments. They destroyed by throwing them over the cliffs all of their race who were imperfect mentally or physically.

It will not be found necessary to throw the imperfect of the present race over cliffs and by so doing bring about violent death, but it will be necessary to have their race die with them. The way to do this—as has been said before—is by the destruction of their procreative ability.

Every effort is being made to improve animal life and produce fancy stock that will bring higher prices. Human beings should demand that the race to which they belong be improved, for, if the fancy breeding and care animals receive improves them, it is certainly right that the human race be treated in like manner and brought up to the state of perfection that will come as the result of perfect breeding.

The words of Old Adam in "As You Like It," apply here as a fit ending to this paper:

"Though I look old, yet I am strong and lusty;
For in my youth I never did apply
Hot and rebellious liquors in my blood,
Nor did not, with unabashed forehead, woo
The means of weakness and debility.
Therefore my age is as a lusty winter,
Frosty but kindly."

Temporary address, 1416 *Dearbon Ave., Chicago, Ill.*

DISCUSSION.

Dr. John G. Du Puis, Lemon City, Fla.—I have enjoyed the paper which Dr. Stone has presented to us. I wish to emphasize the point that we should help educate the people to right living, and I want to endorse what he has said in that respect. We should not divert our attention too largely from the line of thought he has given us. I have practiced among the Indians for fifteen years. They are the aborigines, or the Seminole Indians. Ignorant of the complexities of our civilization, I will mention some of the things these people do. These people keep closely in touch with their little folk and do not hesitate to talk with their children on sexual questions as much as they do on the question of what to eat. They are taught the importance of strict preservation of their virtue. And this fact has caused me to think that in nature this Indian people do exceedingly well. In my district there is a tribe of about 450. I have seen one woman who has had her head shaven for the transgression of her chastity. In fifteen years' experience among them and asking some of the older heads of the tribe, I have been unable to find more than this one instance of transgression. It certainly speaks well for the virtue of the Indians when they can show such an intelligent career of chastity in comparison with our complex society and civilization, and the question occurs to us seriously, were we right to begin to reconstruct and build up on this line when the savages have maintained this idea and done it so scrupulously without written laws or without technical knowledge of their physical selves and without knowledge of the scientific forces of propagation. They seem to possess that instinct, that great attribute of soul preservation, so that the Seminole Indians stand among the finest specimens of physical man, some standing as high as six feet, with square shoulders, with muscles prominent and features well developed, with clear and receptive minds, in the wilds of Florida and will accept knowledge and training the same as the brightest child. And yet this race has maintained a high standard of virtue, although living in the wilds for centuries.

Dr. Bassett—Do you see any venereal disease among them?

Dr. Du Puis—No, sir.

Dr. Lee A. Stone, Memphis (closing the discussion)—I neglected to mention in connection with the reading of my paper some remarkable figures from one state bearing on the question of sterilization, and that state is Indiana.

In the state of Indiana a study was made in connection with 511 families, in which there were known to be mental defectives, yielded the following figures. Total number of persons in 511 families, 1,924; supported in public institutions, 1,334; feeble-minded, 1,249; insane, 54; otherwise defective, 44; illegitimate, 267; one or both parents defective, 1,024.

In the state of Pennsylvania, at this time, there are from 15,000 to 18,000 defective individuals who are not receiving care and attention.

THE ANTERIOR LENS SURFACE.*

By U. S. Bird, M.D.,
Tampa, Fla.

It has been taught that any visible, lenticular opacity is a cataract of some degree. Some

*Read in Section on Ophthalmology, Rhinology, Otology and Laryngoolgy of the Southern Medical Association, seventh annual meeting, Lexington, Ky., November 17-20, 1913.

years ago I observed a condition of the anterior surface of the lens appearing as an opacity, and yet not apparently cataractous. An associate aided me in trying to study out what we saw, but we gave it up. Since, I have seen a dozen similar cases and have become much interested in observing them. I have consulted all ophthalmic literature at my command, but have found nothing bearing on the subject. Sometimes it appears as the only objective symptom; at others it is associated with other conditions, external or internal. In one case it was noted as a sequence of a severe conjunctival infection; it most cases it seems to be associated with a hyalitis. Its appearance is fairly characteristic; a mydriatic is necessary, as the illumination through the normal pupil would show it very imperfectly, if at all. The pupil being dilated, a+ 7 *s* in the ophthalmoscope is used. The lens looks normal, except when the light disk reflex is placed just behind it, so that by slight movements it can be shifted from side to side of the lens. Then minute elevations are seen on the anterior surface, suggesting transparent blisters. They do not, however, always present the symmetrical, rounded surface of a blister, but are sometimes angular at the apex. They may be single, irregularly grouped, or in a linear, ridge-like arrangement. The ridges may be at any angle, and the condition is not limited to any part of the lens surface.

I know of no systemic condition of which it is a symptom. Although I have had no general examinations made, I give K. I. and Hg. The local condition does not usually require energetic topical treatment. It has been seen in young adults only, and in no case has a cataract been known to develop subsequently. A history of one case will cover all important details.

Miss E., age 25; some four years ago fitted with correction for astigmatism. With correction, R=23-XXV? L=23-XX?? 5-8-13 comes complaining of poor vision, discomfort about eyes. R=24-XL L=24-XXX 1-2 plus Cor. Fine, vitreous opacities R eye; sensation of skim over eye. Blister appearance on anterior surfaces both lenses, worse R eye. Duration about one week. I directed Dionin, K. I. and Hg. 5-27-13. Two weeks later, L capsule apparently clear; R, condition still seen, but less marked. 6-26-13. R=24-XXX? L=24 XX 1-2 plus Cor. Vitreous opacities and discomfort gone and both anterior capsules clear. In this case there was a susceptibility to K. I., only three grains daily being tolerated. The condition lasted about two months, and is fairly typical.

Trying to determine what the visual effect of the lens condition might be, I covered the surface of a piece of glass with small drops of water, and found that this reduced visual acuity approximately one-half.

The pathology of this condition is necessarily obscure. The histology of the lens capsule is very briefly discussed in the books. Salzmann says: "This is a typical glass membrane, i. e., a structureless, highly refracting, very firm elastic membrane. A lamellar composition is not ordinarily seen, yet a thin superficial lamella often appears in the region of the lens equator."

If the above is correct, it seems improbable that the capsule alone is implicated. The elevations noted must be due to the presence of liquid between the posterior surface of the capsule and the anterior surface of the lens. If this assumption is correct, it is an interesting exception to the rule that free liquid within the lens capsule means cataract. What may be the origin of this liquid, its composition, the explanation of its inocuousness, and the agency that influences its secretion and absorption, are not known. The condition does not seem to be a serious one. It is apparently self-limited, and short lived, as eye diseases go. However, my rather frequent observation of it, and the fact that information about it was not available, have prompted me to bring it before this section, for I assume that others have seen it, and probably observed it with better results

than I have, even if they have not felt inclined to publish the results of their studies.

Unless the information developed in the discussion changes my present conception of the condition I shall continue to use the treatment referred to above.

While the condition does apparently resolve itself in time, yet I cannot but believe that the medication hastens the resolution.

The satisfactory clearing up of a condition hitherto referred to the grave prognosis class is sufficiently encouraging to justify confidence in the measures used.

UPON THE PREVENTION OF THE COMPLICATIONS OF GONORRHEA.*

By C. O. Abernethy, B.S., M.D.,
Genito-Urinary Surgeon to Leonard Hospital, Raleigh, N. C.

The most important step in the prevention of the complications of gonorrhea is educational. Prevent the gonorrhea. The time has come when the medical profession must lead an educational campaign against venereal diseases. We have advanced too far in preventive medicine to continue letting the public stay in ignorance concerning diseases which have caused such widespread suffering and destruction among the human race.

The mothers and fathers of the land must be taught that the salvation of their children lies in teaching them sex hygiene. No boy or girl should be permitted to reach the age of maturity without knowing what to expect. There has been too much false modesty between mother and daughter and father and son concerning this vital subject. The girls should be taught that menstruation is a physiological function which takes place in all normal women. The boys should know that a very decided and definite change occurs in their lives when they begin to reach the age of maturity. It is much better to have the children learn these things from their parents than from evil companions.

The public must be taught what gonorrhea and its allied diseases are. How they are contracted and how to prevent them. It is a fact that practically all prostitutes have been infected at one time with gonorrhea and the majority of them are infective agents at all times. Therefore, the only safe plan is abstinence.

The dangers and results of gonorrhea must be impressed upon the people. The facts should be made known that about 95 per cent of all operations on women, that over 15 per cent of blindness, that the majority of sterile marriages, and that many other ills of the human race can be traced to gonorrhea.

Especially should the boys and young men be taught that each violation of the laws of nature exacts its toll, and that gonorrhea and its complications are among the most serious diseases which are common to the human race. The present idea seems to be that gonorrhea is a local disease which can be easily cured and is no more to be dreaded than a bad cold. This impression must be corrected and the true state of affairs presented. When the boys know that heart disease, rheumatism, blindness, suffering and death are often the results of gonorrhea, then they will hesitate before laying themselves liable to infection. As has been truly said of all reform movements, the boys and the young men are the ones whom we want to reach.

The physicians have a grave responsibility in the fight against gonorrhea and its complications. The educational campaign must be led by them because they are the best informed concerning this. Some of the methods to be used are:

First.—Lectures. Every physician should accept all opportunities to deliver public lectures upon the subject. Special lectures to school boys are being given in practically all cities in our country by the school physicians.

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*Read before the Wake County (N. C.) Medical Society.

This helps the boys when they need it most. Doctors are being invited by churches and other organizations to address men upon this subject. A great work is being done in this way and more will be accomplished as the plan becomes more general.

Second.—Individual instruction. Patients treated for gonorrhea should be informed concerning the complications. They should know what to expect and be taught what to do as preventive measures. Many complications can be prevented by following this method.

Third.—Thorough and systematic treatment of all cases whether mild or severe. We are all familiar with the gonorrheaic with his hand syringe and injection. He is given a syringe by us and told to use it and come back in the next few days. He goes off and we do not see him again until he comes back with a complication. This is not due to ignorance, but probably to the fact that the average physician has neither the time nor the inclination to give each gonorrheal patient the individual attention that is necessary. Many people are going around with their urine full of shreds who do not know that they still have that old case of gonorrhea which has never been cured. This is sometimes our fault. Of course we know that no case should be dismissed until the urine is clear, but the patient came expecting to be cured in three weeks and we neglected to tell him differently. So when the discharge stopped, so did the patient. Who will be responsible when this man marries and infects an innocent woman?

Fourth.—By being very careful before giving our consent for the gonorrheaic to marry. There is no absolute proof that a patient once infected with gonorrhea is ever cured. There are many tests and we have learned to rely upon them, but after all many cases are never cured. The infection of people after five or ten years interval is proof enough of this fact. Therefore, it is a very serious proposition and puts considerable responsibility on the physician when he tells his patient that he is well enough to get married. There should be a long interval of time and several negative examinations before consent should be given. To reach those who do not consult a doctor, I think, the proposition of requiring health certificates before issuing licenses should be considered. Of course no person infected with any venereal disease should be allowed to get married.

Fifth.—Registration of venereal diseases. The City of New York requires all physicians to report to the Department of Health the names and addresses of all patients with venereal diseases which are treated in the charity hospitals and dispensaries; and requests that the private patients be reported by number. In this way the patients who are not able to pay for treatment, or who do not report regularly until cured, are followed up and required to take treatment. Thus many areas of infection are cleaned up and the spread of the disease prevented. It will be a great step in advance when all cities follow the example set by New York.

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Next Meeting, Richmond, Va., Nov. 9, 10, 11, 12, 1914.

THE SYMPOSIUM ON MALARIA.

Never at any time or in any country has the subject of malaria in all its Protean phases been more thoroughly and scientifically considered, or by men more eminently qualified for its study, than it was at the seventh annual meeting of the Southern Medical Association at Lexington, Ky., last November.

The record of the work there accomplished is crystallized in the papers published under the above heading in this number of the JOURNAL. Those articles, and their discussions, have lifted the veil of obscurity from many clinical phenomena heretofore unexplained. We know now why quinine does no good during an attack of so-called malarial haemoglobinuria; why chills may appear in patients who are taking "tonic doses" of quinine; why it is necessary to quininize them every seventh day for three or four weeks to break up recurrent malarial attacks; why one eminent internist finds just grounds for emphatically condemning the hypodermatic administration of quinine while other eminent internists are equally emphatic in advocating it even where the patients are tender infants; how quinine can be introduced into the systems of delicate patients through the absorbents in the skin with promptness and certainty; how much quinine to give and how and when to give it in various conditions; why it is that a mouthful of solid food will relieve "quinine prostration" like magic, and other practical points of importance whose existence in many instances was known but not understood for years, until today pharmacology and research have found the key to the puzzle.

Fortunately, too, there were differences of opinion among the doctors, showing an independence of thought that refused to bow to authority, however eminent.

No matter how well read a doctor may be upon malaria, or how much experience he may have had in treating it, he cannot justly claim to be fully informed upon the subject until he has read the articles of this symposium. Doc-

tors will do well to bring them before their local medical societies for study and discussion. Up to this date they contain the latest advances in the investigation of this all-important subject.

THE EMPIRE OF THE SOUTHERN MEDICAL ASSOCIATION AND ITS JOURNAL.

How many readers of this JOURNAL ever consider, even in a careless, desultory manner, the vast extent of territory covered by the SOUTHERN MEDICAL JOURNAL, and the immense number of people who inhabit that territory?

It is delivered at a multitude of postoffices scattered over sixteen Southern States, some of which, like Texas, are alone larger than England, Ireland and Scotland combined. Other Southern States are larger than the German Empire, and the sixteen taken as a whole are larger than any civilized empire excepting those of India and Russia. Scattered over this immense area there are thirty-nine thousand doctors, each one of them occupying a position of honor and influence that includes the intelligent citizenship surrounding him; each one of them inspired by a spirit of progress and improvement, and whose example in dress, literature, mode of life and so on is powerful in directing the taste and actions of scores of purchasers, and many of the leaders in this vast empire are members of the same great society whose official organ, carefully edited and absolutely reliable in every word from cover to cover, reaches him each month, and is promptly read and discussed. Realizing all this, the following reflections seem warranted:

First. Contributors of medical articles should be careful. An error might result seriously to patients, and would be mortifying to the writer when that error was discussed by other writers better informed.

Second. The editors of such a journal should guard the gates against the errors of writers who are not members of the society, and whose articles, therefore, have not run the gauntlet of discussion by members, as have those regularly contributed, especially if any possibility of error is discernible therein.

Third. The editors should be especially careful that no expressions of their own should advocate an error or shield an evil.

Fourth. And those who use the advertising pages of the SOUTHERN MEDICAL JOURNAL should feel that a properly written advertisement of a desirable article so published throughout such an empire is like seed sown broadcast in a fertilie soil and cannot fail to result in an abundant harvest.

A CURE FOR FEE-SPLITTING.

A well known surgeon recently did the proper thing when he suggested to a wealthy patient, who was paying him a liberal fee, that there was another man to whom the patient was more deeply indebted than to the surgeon. "I mean Dr. Blank, of your town, who recognized the character of your case, and then, instead of wasting precious time in doubtful treatment, promptly sent you for surgical relief, thereby probably saving your life. He did not stop to think of the fees he was losing, but sent you to me at once. Now, I do not know Dr. Blank personally, but the letter he gave you to bring here shows that he is a master in diagnosis, and let me tell you that there are ten good surgeons where there is one good diagnostician. The services of such a man are worth at least as much as mine, and I hope you will see that he is well paid. You owe it to him, whether he puts it in the bill or not."

If all surgeons were as honest and just as this one there would be no "fee-splitting." There would be no shadow of an excuse for it, as the general practitioner would no longer be afraid to charge referred cases the extra fee he felt was his right. And the patient would expect it.

It is a matter wherein the general practi-

tioners should agree in free and open discussion with the specialists and surgeons, and then proceed jointly to educate the public to take the proper view.

THE FIRST REPORT OF THE THOMPSON-M'FADDEN PELLAGRA COMMISSION.

The Thompson-McFadden Pellagra Commission has presented its "first progress report." The unabridged report is a paper-covered book of 148 pages, full of clinical data and statistical tables and profusely illustrated. It discredits the spoiled maize theory and the Sambon theory, but recognizes a mere possibility that the bite of an infected stable fly, Stomoxys calcitrans, may transmit the disease. It recognizes indications "that pellagra is an infectious disease, in some way transmissible from person to person," but the "particular mode of transmission" is not at all proven to its satisfaction.

It concludes: "Our ideas concerning the location of a hypothetic infection in the body of a pellagrin and the exact mode or means by which it gains the body of a new victim are very indefinite." Thus far the investigation, though inconclusive, has been logical and thorough. The report was prepared by Capt. J. F. Siler, Medical Corps, U. S. A.; Passed Assistant Surgeon P. E. Garrison, U. S. N., and Dr. W. J. McNeal, Assistant Director of Laboratories in the New York Post-Graduate Medical School, with several other prominent collaborators. Capt. Siler is an Alabamian by birth and a graduate of the University of Virginia.

It is to be hoped that the Commission will continue its valuable work. It is to such unbiased investigations by able men free from any theories, and not afraid to say, "I do not know," that we must look for the final solution of this most difficult problem.

To the writer everything indicates that pellagra is primarily a gastro-intestinal intoxication, or infection, and until the spoiled corn theory has been thoroughly disproved, or the etiology discovered with certainty, no effort should be spared to prevent the sale, or use, of impure corn products.

SORDID MOTIVES IN HONORED POSITIONS.

Much blame has been attached to religious newspapers for publishing the advertisements of notorious fake nostrums well known to be absolutely worthless and a fraud upon the innocent purchaser, who has so much faith in the eminent D.D. who edits the periodical that he believes all that the eminent D.D. allows to appear therein. The acceptance of the dishonest ads by the eminent D.D. is not to be condoned by his ignorance concerning their character. He knows their worthlessness very well, for such articles are repeatedly exposed by some of the standard medical journals, and sometimes by such great literary publications as the *Saturday Evening Post* and *Collier's Weekly*. There is but one reason, one explanation possible. It is the sordid greed for gain.

The eminent D.D. permits the odor of his sanctity to disguise the stench of a heartless cruelty that robs the poor and suffering under false pretenses, and often steals from them the brief and precious time that would enable scientific medicine to save their imperiled lives. It is a cruel breach of confidence.

But religious journals are not alone in this unpleasant form of delinquency. Certain well known *medical* journals, with long lists of medical subscribers and many prominent medical and surgical contributors, have been much blamed for publishing the advertisements of proprietary preparations well known to be absolutely worthless, and a fraud upon the confiding doctor, who has so much respect for the eminent M.D. who edits the periodical that he believes all that the eminent M.D. allows to appear therein. The acceptance of the deceptive ads by the eminent M.D. is not to be condoned by his ignorance concerning their

character. He knows the fallacy of their claims very well, for they have been mercilessly exposed by reliable investigators employed by organized medicine for the purpose of protecting its members against being deceived by just such pretensions. There is but one reason, one explanation why a reputable medical journal should persist in publishing a deceptive advertisement of an exposed fraud. It is the sordid greed for gain. The eminent M.D. has permitted the dignity of his position to be degraded as a cloak to hide the unworth of fallacious pretenses that rob the conscientious doctor of the weapons which he needs in fighting his daily and hourly battles with disease and death, weapons he would have utilized had not his trusted guide betrayed and misled him, for profit. It was a breach of confidence, and unfortunately, others unconsciously and innocently aided and abetted the fraud by permitting their own original articles over their own signatures to appear in the pages of such a journal. In such instances, the finer the articles and the more famous the contributors, the greater the mischief. Hard-working Dr. Cityman has time to read only one or two journals. In one is an article by Dr. Esculapius, in the other is a contribution by Dr. Hippocrates. In both is an advertisement, say of Sanatogen, flamboyant, extravagant, statistical. "Just what so-and-so needs! Must be all right, for Esc. and Hipp. wouldn't contribute to an unreliable journal." "And there you ar-r-re," as Dooley says.

Fellow Doctors: D.D.s may preach and M.D.s may talk, but fraud and deceit are dishonest, dishonorable, damnable!

There is no getting around that.

SOUTHERN MEDICAL AUTHORS.

In view of the fact that the vast majority of the text-books used in the teaching of medicine are the product of minds unfamiliar with conditions that modify disease processes in the Southern States, the JOURNAL is always glad to welcome any new accession to Southern medical literature.

The desire for medical books composed or modified by Southern authors is inspired by something more than local pride or loyalty. There is a real need of recorded observations, opinions and conclusions of things Southern because some conditions are peculiar to and others are modified by the climatic and social environments there prevailing. This is especially true in therapeutics. Whatever may be the ultimate cause, it remains true that men of the South, equal in ability and experience to those in the Northern and Eastern States, sometimes hold opinions and principles of treatment in numerous conditions entirely at variance with those of the latter. So much is this the case that often where text-books and professors in great Eastern colleges declare that such and such drugs are inert and useless, or that these or those plans of treatment in various forms of illness are erroneous and perhaps injurious, the Southern practitioner opens wide his eyes in honest surprise, and declares flatly that he knows better! That the experience of half a lifetime has taught him the true value of the things the others condemn, and that, in his opinion, if the doubters had given close personal attention to their cases instead of leaving them to the unfeeling care of public hospitals they would know better also, in spite of frogs, cats and guinea pigs.

Now the truth must lie between extremes, as is almost always the case in chronic disputes, and the Southern view, though rich in supporters, lacks expositors. Therefore, the JOURNAL welcomes "Pharmacology, Clinical and Experimental," a text-book which is reviewed on another page. Though the authors are noted doctors of Vienna and Heidelberg, yet the translator is a Southern doctor, a professor in a Southern university. He is Dr. John Taylor Halsey, a graduate of Johns Hopkins and Professor of Pharmacology, Therapeutics and Clinical Medicine in the Medical

Department of Tulane University, New Orleans.

The book is worthy of the confidence of Southern physicians. It is logical, thorough and practical, and remarkably free from the nihilistic tendencies that, born of ignorance, are sapping the very foundations of medicine and making broad and easy the path of the proprietary medicine manufacturer.

DR. ISADORE DYER, PRESIDENT OF THE ASSOCIATION OF AMERICAN MEDICAL COLLEGES.

Every reader of this JOURNAL notes with approval and pleasure the election of Dr. Isadore Dyer, of New Orleans, to the important position of President of the Association of American Medical Colleges.

No Southern physician is more widely and favorably known than Dr. Dyer. As Dean of the Medical Department of Tulane University, he has impressed his personality upon a generation of young physicians who are winning honorable consideration wherever they seek to establish themselves. As editor of the widely read *New Orleans Medical and Surgical Journal* his name is known and honored by thousands of doctors all over the country. As the most authentic American student of leprosy, his writings upon that subject have been read and studied in many nations.

His election to a position of such nation-wide importance is another indication, among many, that Southern physicians and their work are beginning to attract the attention of students all over the United States, and to receive hat consideration that is their due. Last, but not least in our estimation, Dr. Dyer is an earnest, highly esteemed member of the Southern Medical Association. He was its President in 1910-1911, and his judgment is always potent in its deliberations.

The JOURNAL prophesies a successful administration for Dr. Dyer as President of the Association of American Medical Colleges.

SURGEON-GENERAL GORGAS TO VISIT MOBILE.

The city of Mobile and the medical profession in Alabama are planning a triumphal welcome for Dr. William C. Gorgas when he comes to participate in the commencement exercises of the School of Medicine of their State University on the 28th instant.

As a native Alabamian, born in Mobile County, educated in the University of Alabama, wherein both his parents served with dignity and usefulness for many years, it is right that he should receive such a welcome on his home coming as will show the world how much pride the citizens of Alabama feel in his achievements.

Though he is primarily the guest of the Medical School, he is also the man we all delight to honor, and his visit should be made a civic as well as a professional occasion. Rome voted her victorious generals a triumphant home-coming, but no blood-stained Roman victory was ever so fraught with benefit to mankind as is the overthrow of the hostile natural forces of tropical climes which has been accomplished by our own eminent fellow citizen, Dr. William C. Gorgas, Surgeon-General of the United States Army.

REPORT OF VIRGINIA STATE EPILEPTIC COLONY.

The Fourth Annual Report of the Virginia State Epileptic Colony, covering the period from October 1, 1912, to September 30, 1913, presents several matters of interest to physicians and others interested in the welfare of the unfortunate class under consideration. It forms a paper covered booklet of 67 pages, containing diagrams and pictures worthy of study. From the statistical tables one can glean some very important information. It appears that during the year 14 were discharged, 8 died, 13 were out on "furlough," and 2 "eloped." The total number in hospital and on furlough September 30, 1913, was 144. From the beginning the age of the largest number received was from 20 to 25 years, being 33 in

number. Naturally, there were four times as many single patients as married. Heredity was considered the cause in about one-third of the cases; alcohol in one-twenty-eighth of the whole. It first appeared at almost any age, but chiefly from 15 to 30.

There were 31 deaths during the year, of which only 4 were from *status epilepticus* and 3 from epileptic seizure. There were 3 who could not tell their names, 15 their ages, 23 the year, 16 the month and 13 the day of the week.

Dr. Priddy, the resident superintendent, does not consider sterilization of these defectives a sufficient preparation for allowing them to associate with the general public, because, as is well known, though procreation cannot result from their actions, the sexual desire, which generally is abnormally great in them, is not diminished by the operation, and they would debauch innocent youth and disseminate venereal diseases to a deplorable extent if supervision and official control were abrogated. Hence he believes in careful "segregation and custodial care."

SHALL DOCTORS DISPENSE THE MEDICINES THEY PRESCRIBE?

A correspondent, who has engaged to read a paper with the above title before his medical society, writes to this JOURNAL asking for "light."

Unfortunately much of the literature written on the subject has appeared in journals owned or controlled by manufacturing drug concerns who make the preparations that a dispensing doctor would need in his practice, so that whatever they might print in favor of the custom would naturally be viewed with distrust. The truth is that the question cannot be properly answered with a plain "yes" or "no."

Some doctors should, and some should not, dispense. Circumstances alone must govern the case. Every practicing physician should carry with him a few medicines needed in emergencies, such as salts of morphine, morphine and atropine, atropine, apomorphine, cocaine and tablets of nitroglycerine. A six-vial hypodermic case will accommodate these. In a city or town provided with competent druggists they are all that will often be needed before a prescription can be sent or 'phoned to the pharmacist and the medicine delivered. But where patients live a mile or more from any drug store, as is the case in any practice centered in the average rural town, it would be an unnecessary burden and delay to make people wait, perhaps for hours, for the medicines that could be provided in a compact, reliable, tablet form by the doctor himself, who would then be apt to see the first dose administered, and probably would gain additional information concerning the character of the case by so doing. People in the outskirts of town, or in the country, appreciate such attention, and will not object to a small charge for the medicine. But prescriptions that are bulky or composed of expensive medicines should be furnished by the registered pharmacist; accurately and carefully prepared precisely as demanded by the prescription. When such a prescription is sent over the telphone it should invariably be written first, and then read into the receiver, and repeated back by the druggist. This is a necessary protection for the doctor, the pharmacist and the patient. Indeed in this matter of dispensing by the physician the true course lies between the extremes. Fortunately the doctor may rest assured that when he uses the tablets or pills manufactured by any of the well-known houses he may feel confident of their purity and strength.

This was demonstrated by the careful analysis made in 1913 in the laboratory of the American Medical Association. Pills and tablets bearing the labels of most of the well-known manufacturing chemists and pharmacists were bought in the open market for analysis, and the conclusion reached by one who reads the tabulated report is that they are all remarkably up to the proper standards.

It does not seem right or proper, however,

for any physician to furnish medicines for the sake of the profit he can make on them, when a reliable pharmacist is within reach ready to serve him. To do so would be to place himself on a par with the prescribing druggist.

THERAPEUTICS

ORGANOGRAPHY.

In 1889 the well-known scientist and investigator, Brown-Sequard, caused a furore throughout the civilized world by his glowing accounts of the results, upon himself and his patients, of the hypodermatic injection of an extract from the testicles of animals, extracted while they were fresh from the body. Sexual debility, whether arising from old age or dissipation, was banished, youthful vigor was restored to every muscle, so that he could bound up the stairways which he had previously climed with effort. Whether exaggerated or not, such were the first reports received, and the civilized world at once hastened to rob convenient goats and rams of their testicles, and, in one way or another, extract their "testicular juice" for the hypodermic syringe. Of course, many lamentable accidents followed the unskillful management of such readily decomposable material, many conflicting reports as to results were published, but gradually the public interest subsided and the subject ceased to be debated. Meanwhile, serious investigators, realizing that there must be a basis of fact under any assertion made by the distinguished French scientist, continued the investigation, not only concerning testicular juice, but concerning the secretions of all the glandular organs. The result so far has been to open to medicine a door to unsuspected riches. Unfortunately, charlatanism was too wide-awake to allow such an opportunity to pass unimproved, and enterprising firms of so-called manufacturing chemists offer to the physician the extracts of the different organs, with extravagant claims for their usefulness, as well as extravagant prices for their wares, backing up their claims with enthusiastic certificates from too credulous physicians. The same conditions were thrown round electricity when first it was introduced into medical use, until the ethical practitioner was sick of its name. Yet today its great value is recognized and its place established. In like manner, animal extracts are reviving from the obloquy following their unfortunate introduction, and most of them can now be studied intelligently as elements of materia medica.

GLANDULA THYROIDEA SICCA.

Dessicated thyroid glands are furnished in powdered form and in capsules or tablets of three grains each (0.19 gm). They contain a peculiar chemical substance, iodothyrin, rich in iodine, which is supposed to be the active therapeutic agent, though iodine alone cannot parallel any of its effects. The same results are obtained by eating the partially cooked thyroid glands of sheep. Excessive doses cause palpitation of the heart, difficulty of breathing, restlessness, loss of flesh and a sense of distress. Its most brilliant results are shown in the treatment of myxedema, for which it seems to be a specific. One case of myxedema now under my observation, complicated with decided acromegaly, is only held in check by the eating of from one to two sheep thyroids a week. More than that causes distress; less allows the symptoms to return. It is also used in goiter, cretinism, excessive obesity and psoriasis, with more or less success. Exophthalmic goiter, on the other hand, seems dependent on excessive thyroid secretion. The dose of the dried and powdered gland is two or three grains a day, gradually increasing to six or nine grains (0.12-0.19 gm. to 0.38-0.58 gm.). The appearance of tachycardia should cause an interval in the treatment. The effect should be closely watched and upon the first indication of unfavorable results the dose should be reduced or suspended.

From a fourth to half a sheep thyroid may be eaten, cooked "rare," as a beginning, and repeated in three or four days, according to effect.

Other glands have been used with varying reports resulting, but none save the suprarenal has acquired an established position in therapeutics.

ADRENALIN.

Adrenalin is the active principle from the suprarenal glands, generally those of sheep. It is one of the most powerful substances known to materia medica. That power is exerted principally upon the muscular fibers of the blood vessels and internal organs. A particle of it dissolved in ten thousand times its weight of water will, if a few drops are placed in the eye, squeeze the blood out of the capillaries of the conjunctiva, causing it to turn pale. Similarly applied to a

mucous membrane, it will render it bloodless, so that it may be incised and no hemorrhage will follow. This contraction lasts some thirty minutes, and may be reproduced repeatedly at will. It is furnished in a solution, one part to a thousand, and this solution is the strength most frequently employed.

Internally administered, it seems to lose much of its power, probably through digestion, or by elimination by the liver, but administered hypodermically it acts as a powerful but transient stimulant to the heart, though the effect lasts but three or four minutes. Its action becomes stronger and more rapid, and there is a great rise in the blood pressure. The vessels of the brain, the internal eye, and the lungs are but slightly affected by it, but those of the abdomen show its full effect. Intravenously c.c. 1. to 2. of 1:1000 solution promptly stimulates the heart, yet the effect is brief. The secretions of the liver, intestines and salivary glands are increased, and sometimes glycosuria of a temporary character follows large or repeated doses.

In inflammations of the conjunctiva it cures by depleting its vessels, and the same is true of superficial inflammations of the nares, larynx and pharynx. In the hyperaemic stoppage of the nares consequent upon a cold, a spray of one to two thousand will promptly relieve it and clear the passage. A drop or two of the standard solution in the ear will often permanently relieve annoying tinnitus. In supraorbital neuralgia, and indeed in any superficial neuraglia, the unofficial suprarenalin ointment smeared along the course of the nerve will stop the pain, and often it will not return. In operations on the eye, nose, mouth or throat, hemorrhage is entirely avoided by combining the solution of adrenalin with that of the local anesthetic selected.

According to Osler, it is useful in Addison's disease. The hypodermatic use of an adrenalin solution has sometimes caused such an ischaemia at the point of insertion that sloughing results. It is well to inject only small doses, and have them well diluted.

Adrenalin should not be continuously administered in any dose for many days successively. Butler considers ten days sufficient, and one milligramme, or 1-75 of a grain, a day the limit.

When arterial tension is already too high, when there is aneurism or when there is atheroma of the arteries adrenalin is contra-indicated. Its uses continually extend, and it is destined to become one of our most useful drugs.

PITUITARY EXTRACT.

Extracted from the posteriot portion of the pituitary at the base of the brain, once considered the seat of the soul. An excess of this secretion is supposed to result in giantism, and to be the cause of Acromegally. It is used both intravenously and hypodermatically. Injected into a vein its effects resemble those of adrenalin, slowing and strengthening the heart and increasing arterial pressure. These effects last from five to ten minutes, which is considerably longer than those of adrenalin.

But the mechanism of the action is different, being "a muscular and not a vagus effect." (Bastedo.)

From 10 to 15 minims intra-muscularly injected is used to control post-partum hemorrhage and menorrhagia. Small doses hypodermically administered increase peristalsis. It has been used to relieve peristaltic paralysis.

It is free from poisonous properties.

LECITHIN.

Lecithin is a recent addition to materia medica, derived from the yolk of eggs. According to the report of the Council on Pharmacy and Chemistry of the American Medical Association, it contains "the esters of oleic, stearic and palmitic or other fatty acids with glycerophosphoric acid combined with cholin." It is a yellowish-brown waxy substance, insoluble in water, but soluble in alcohol, choloroform and other solvents. It is claimed to act as a stimulant to nutrition and not as a direct nutrient. It increases the number of red blood corpuscles and large, mononcular leucocytes. "It is held to be useful whenever there is faulty growth or nutrition, and is especially recommended as an addition to cow's milk for artificially fed infants." It is not poisonous in any doses. If no improvement is seen after using it ten days it may be discontinued. The dose is one and a half to eight grains a day (0.1 to 0.5 gm.) in pill form. Infants take one-third of these doses.

NUCLEIN.

Nuclein is a very complex substance, containing a large percentage of phosphorus. It is supposed to exist in all cells as nucleinic acid. Internally administered, it is claimed to visibly increase the leucocytes within two or three hours. In some instances the polynuclear leucocytes have increased threefold in a short time. It is therefore supposed to be useful in all diseases caused by bacterial invasion which is combated by phagocytosis. In such cases large doses, one to two

fluid drachms (4.0-8.0 c.c.) should be given on an empty stomach three times a day. On the other hand, as a general tonic and bloodmaker, small doses, 15 drops (1.0 c.c.) should be given at similar intervals and continued for ten days. Then a week should pass before more is taken.

CORRESPONDENCE

DR. KRAUSS' CORRECTION.

Memphis, Tenn., April 15, 1914.

Editor Southern Medical Journal:

The account of the discussion of my discussion of the Milk Symposium in your last issue works an injustice to the Memphis Health Department and to the milk plant in Memphis to which I alluded. This is doubtless due to the five-minute rule not permitting a clearer discussion.

The "first warning" alluded to is a heavy fine; the "second warning" is a still heavier fine; the third works a revocation of the license. The employment of a bacteriologist under the control of the health department, to whom he makes daily reports of his platings, and paid by the milk company, was criticized on the ground that "the contractor was paying the inspector, who would lose his job if he failed to please the man who is paying his salary."

What was omitted from my remarks was that this system did not exempt the milk of this company from the usual inspection on the street and in the shops, and that, consequently, this man's job depends upon his ability to keep the company from the clutches of the law, and not upon his ability to cheat for them. The regular city bacteriologist still continues his control of this, as well as other, milk offered for sale.

Yours truly,

WM. KRAUSS, M.D.

GOVERNMENT MORTUARY STATISTICS.

Shreveport, La., March 13, 1914.

Editor Southern Medical Journal:

The South has been misrepresented in Government mortality reports so long that I was not surprised at your editorial expressing gratification at the star given us by Dr. Cressy L. Wilbur, the star intimating that the true health conditions of the South were not shown in the Government mortality reports.

Don't you think it is time for the South to demand a fair deal in Government mortality statistics? The unjust high death rate given the South has done us more injury in a material way than the Civil War. Why not have mortuary statistics that really show the health conditions of the various sections of the country instead of a star to indicate that the reports are worthless, for they are worthless if the true health conditions are not shown?

In the Government mortality reports for the years 1910 and 1911, in addition to the total rate, the whites and colored were rated separately, and the great wrong done the South in the Government method of keeping mortality reports exposed, for it was shown the death rate per 1,000 among the colored was practically the same in the North and South, but in the North the colored were so few in comparison to the total population that in many states their inclusion in the total rate did not increase the rate at all, and where it did increase it, it was usually .1 or .2 to the 1,000 of population, while in the South the increase over the white rate by their inclusion ranged all the way from 3.4 to 11.4 in Charleston, S. C., the increase depending on the size of the colored population. The white rate of the South could be compared with the total rate of the North without doing that section any injustice, for the increase in any of the Northern states by including the colored is so trivial as not to materially increase their death rate.

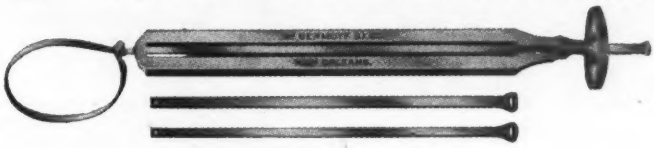
The Shreveport Board of Health has passed the enclosed resolutions, requiring the rating of whites and colored separately in all Government mortality reports and the rating of cities on the resident deaths, and when this is done, the South, instead of being published as a pest hole with the authority of Government approval, it will, in my opinion, be shown to be the healthiest section of the United States for both white and colored. This classification will be adopted, for it is certainly fair to compare whites to whites and colored to colored in the various sections of the country; besides, the statistics would be valuable as showing the real health conditions of both races, whereas under the present system the health conditions of neither race are shown.

I hope your efforts will be used to give publicity to the facts, for all that is necessary is for it to be investigated by our lawmakers, for the whole people regardless of the section are interested in

(Continued on advertising page 16.)

A New Device For The Treatment of Fractures

By DRS. F. W. PARHAM and E. DENEGRE MARTIN, New Orleans, La.



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This device is truly a valuable adjunct in the treatment of fractures.

Further detailed description and method of using will be furnished upon request.

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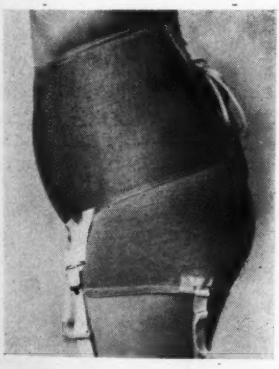

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Obesity
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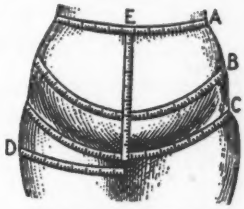
We Make a Special Support for Entero-optosis

Write us for prices and literature

State whether for man, woman or child.



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A—Waist.
B Abdomen.
C—Hips.
D—Thigh.
E—Height.

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the publication of the true health conditions of the various sections of our country.

You speak of efforts being made by a number of Southern states to get into the Government registration area. If they do so under the present method of keeping statistics, it will be a sad day for the South. Our large negro population will give us a death rate that will be appalling, and it will be stamped with the Government approval, and two stars will fail to correct the misrepresentation.

G. C. CHANDLER, M.D.,
President Shreveport Board of Health.

RADIUM.

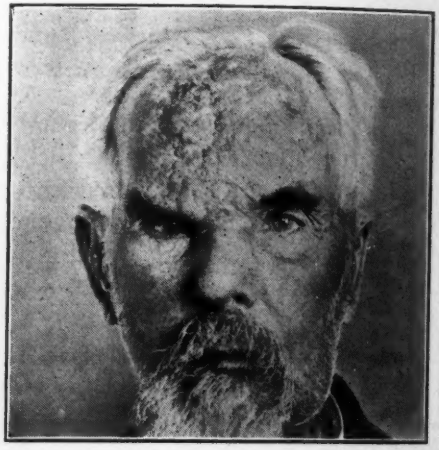
Newton, Miss., February, 1914.

Editor Southern Medical Journal:

I have just read with a great deal of pleasure your editorial on radium in the current issue of the Journal. During November and December last my wife was in Baltimore under the treatment of Dr. Howard A. Kelley, and while there with her I had the opportunity of seeing what Dr. Kelley is doing with radium, and I was greatly impressed with the results he is getting. I am sure that Dr. Kelly has been much misunderstood and misquoted as to his use of radium.

No. 1. Periosteal sarcoma frontal bone with large metastases in front of left ear and under left jaw. Also on right. Condition on Sunday before fifty (50) hours' radium treatment.

Dr. Kelly never depends on radium alone in the operable cases. He always does the radical operations and applies the radium before and after operating. In the hopeless and inoperable cases he uses radium alone. In the operable cases radium is used as an adjunct to surgery. His claim is that radium is the handmaiden of surgery.



No. 2. Same patient two (2) days after treatment. Entire disappearance frontal mass. Complete subsidance metastases in front of ear and under jaw rapidly shrinking.

I am enclosing two pictures of a very interesting case which was treated while I was there and the results were wonderful. The first picture shows the patient before the use of radium and the second shows the condition after radium had been applied continuously for fifty hours.

With best wishes for the continued success of the Journal and association, I am,

Very truly,

I. W. COOPER, M.D.

BOOK REVIEWS.

Infection of the Hand.

A Guide to the Surgical Treatment of Acute and Chronic Suppurative Processes in the Fingers, Hand and Forearm. By Allen B. Kanaval, M.D., Assistant Professor of Surgery, Northwestern University Medical School, Chicago, Ill. Cloth, $3.75. Lea & Febiger, Philadelphia and New York; 1914.

This splendid work fills a long felt want in the library of the general practitioner. The frequency of hand injuries, the disastrous results which may occur and the importance of the proper treatment are well known. This book is the result of several years of work and comprises experimental and anatomical investigations carried on in conjunction with careful clinical observation of an extensive number of cases. His splendid reports on abscesses of the fascial spaces and in tendon and sheath infections are revelations. The chap-

(Continued on page 18.)

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Urinalysis	2.50
Bacteriological Examinations	$2 to $5.00
Blood Analysis	$2 to $ 5.00
Sputum Analysis	$3.00

Entire professional services devoted to laboratory work. Containers and further information mailed on request.

J. D. ALLEN, A.B., M.D., Director

BOOK REVIEWS

(Continued from page 16.)

ter grouping facilitates reading for the general practitioner; the illustrations are splendid, and the index is very well arranged.

Anatomy and Physiology—A Text-Book for Nurses.

By John Forsyth Little, M.D., Assistant Demonstrator of Anatomy, Jefferson Medical College, Philadelphia. 12mo., 483 pages, with 149 engravings and 4 plates. Cloth, $1.75, net. The Nurses' Text-Book Series. Lea & Febiger, publishers, Philadelphia and New York, 1914.

Like others of the "Nurses' Text-Book Series," it is concisely written, is well illustrated and has a very valuable glossary. The cuts are well chosen from standard works on anatomy, and the colored plates beautifully illustrate the position of the various bones of the skull and the different phases of the circulation.

Diagnosis in the Office and at the Bedside.

The Use of Symptoms and Physical Signs in the Diagnosis of Disease. By Hobart Amory Hare, M.D., B. Sc., Professor of Therapeutics, Materia Medica and Diagnosis in Jefferson Medical College of Philadelphia. Lea & Febiger, Philadelphia and New York; 1914. Seventh edition, pages 547, 164 engravings, 10 plates. Price, $4.

Few writers have been so prolific as Dr. Hare without cheapening the value of their productions by dilution, but every successive book by him seems to excel its predecessor in value and usefulness. A doctor cannot learn how to practice medicine by studying any two books in existence; but a doctor who already knows how to practice medicine can rely upon the companion works, Hare's Therapeutics and Hare's Diagnosis, to so thoroughly refresh his knowledge that with them ready at hand upon his desk he can promptly prepare himself to meet almost any ordinary emergency that can confront him. This diagnosis omits most of the laboratory work and presents the symptomatology seen in the office and at the bedside. It differentiates the interpretations pertaining to symptoms similar in appearance but from different causes, and leaves no investigator any room for confusion or doubt. The illustrations are abundant and admirable and the index copious and complete.

Pharmacology, Clinical and Experimental.

A Groundwork of Medical Treatment, Being a Text-Book for Students and Physicians. By Dr. Hans H. Meyer, of Vienna, and Dr. R. Gottlieb, of Heidelberg, Professors of Pharmacology. Authorized Translation into English by John Taylor Halsey, M.D., Professor of Pharmacology, Therapeutics and Clinical Medicine, Tulane Univesity. With 65 text illustrations, 7 in color. Price, $6. J. Lippincott Co., Philadelphia and London.

This substantial volume of some 600 pages is both a rebuke and an antidote to the therapeutic nihilism which characterizes the teaching in so many medical schools. No one can follow its logical course without being impressed with the many directions in which medicine may be used to affect physiological and pathological processes. Their proper application to the treatment of diseases depends upon the ability of the student to interpret symptoms, tests and microscope slides and to bring them together in his mind.

Pharmacological studies have shown the effects of drugs upon the tissues or functions involved. Logical treatment must follow.

Pharmacology would be a wasted study were it not articulated with therapeutics. In this work that conjunction is so thoroughly accomplished that as a whole it leaves little to be desired.

SOUTHERN MEDICAL NEWS

ALABAMA.

At Birmingham on Tuesday, March 17, Dr. and Mrs. E. R. Eldridge celebrated the fiftieth anniversary of their wedding.

At Selma, March 8, Dr. V. B. Potts, aged 34, a well-known physician of Mapleville, died of pneumonia.

At Birmingham, March 11, Dr. G. B. Copeland, one of the veteran physicians of the city, died of tetanus. It resulted from a slight scratch just above the knee of unknown origin.

Dr. Robert Nelson, City Health Officer of Birmingham, resigned his office in March in order to resume private practice. He was one of the two physicians who examined James G. Oakley, ex-President of the Penitentiary Board, on the 4th of March and reported that his physical condition would not prevent a trial.

The Alumni Association of the School of Medicine of the University of Alabama will hold its annual meeting at the Medical College Building, Mobile, at 11:00 a. m., May 27th, Dr. Angelo Festorazzi, the President, in the chair. Papers by eminent alumni will be read and discussed. There will also be a banquet at the Battle House at 8:00 p. m. A large attendance is expected.

Dr. Gaston J. Greil, of Montgomery, has announced the removal of his office to the Bell Building, and that he will limit his practice to diseases of children.

ARKANSAS.

At Rogers Dr. Fergus, County Health Officer, found quite a number of cases of smallpox in the county, several of whom died. Many of the cases were brought by visitors from Mexico and some were contracted at Tulsa, Okla.

At Helena in February the entire City Board of Health resigned, alleging a lack of co-operation by the Mayor and City Council as the reason.

At Ouchita, Dallas County, some salt wells have been overflowing and making large pools wherein malarial mosquitoes freely breed. The State Health Officer, Dr. Morgan Smith, accompanied by

(Continued on page 20.)

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NEW YORK PHILADELPHIA SAINT LOUIS

MEDICAL NEWS

(Continued from page 18.)

the County Judge and a civil engineer, took charge of the nuisance and caused it to be abated.

On the 25th of February, the proprietor of a well-known drug store in Little Rock was arrested and fined $50 and costs for selling cocaine without a prescription. The only testimony against him was that of the cocaine victim, and the druggist denied that he even kept the drug in his store. His attorney filed notice of appeal.

In the neighborhood of Elm Spring, Washington County, a severe type of smallpox prevailed about the 1st of March. Nine or ten persons died from the so-called black smallpox. The State Board of Health was urged to send immune nurses and stop the useless sacrifice of the lives of the devoted friends and relatives who were unprotected by vaccination.

At Moutnain View there has been an epidemic of measles of a severe type and several deaths resulted. Schools and churches were closed on account of it.

At Eureka Springs two students in each room of the local public schools were made members of a school health board. Their duty is to report all violations of a common-sense health code and to co-operate with the teachers in keeping the schoolrooms and grounds clean and sanitary.

GEORGIA.

A travel-study tour of Southern doctors begins in June under the auspices of the Georgia Surgeon's Club. The party will spend June 8 in Baltimore as guests of Dr. Howard Kelly. It will visit the clinic of Dr. J. B. Deavers in Philadelphia and the 10th, 11th and 12th will be spent in the various clinics of New York. A tour is also arranged for attending the Clinical Congress of Surgeons of North America in London in July. They will also visit Dresden, Berlin, Leipsig and other European surgical centers.

At Atlanta the Grady Hospital is considered not large enough. It is supposed to need a special department for contagious diseases. To remedy the defect, the "Rotary Club" has started a movement for a contagious disease hospital and it argues that the county of Fulton, of which Atlanta is the county seat, should help pay the cost of maintenance.

In Macon, out of the 1,292 public school children medically inspected, 1,025 were found defective in some respects. Eyes, ears and teeth furnished the chief defections.

The Seventh District Medical Society held its thirteenth session in the Cherokee Hotel in March as the guests of the Floyd County Medical Society. The following officers were elected: Dr. W. G. England, of Cedartown, President; Dr. J. H. Hammond, of Lafayette, Vice-President; Dr. W. L. Funkhouser, of Rome, Secretary. Cedartown was selected as the meeting place for October.

The Woman's Club of Rome has petitioned the City Council to create a city board of health, a majority of whom shall be physicians, the board to appoint a city milk inspector for the supervision of dairies and the systematic bacteriological examination of milk.

At Atlanta, March 13, the Atlanta Anti-Tuberculosis and Visiting Nurses' Association held its fifth annual meeting in the Carnegie Library, President Hugh M. Willet presiding. The President announced that lack of funds has greatly hampered the work of the nurses in the past year and that an appeal would be made to the City Council for finanical aid.

The State, County and Municipal Health Officers' Association held its annual meeting in Atlanta on April 14th. The following officers for 1914-1915 were elected: Dr. A. V. Wood, Brunswick, President; Dr. T. F. Abercrombie, Brunswick, Secretary-Treasurer.

KENTUCKY.

In February at the State Confederate Home, at Pewee Valley, Dr. James McDowell, retired physician, 89 years old, died, and was buried in the Hebron Cemetery, near Okolona.

At Carlisle, March 4, Dr. R. L. Morford died of pneumonia.

On March 5, at Lexington, Dr. N. R. Simmons, City Health Officer, announced that smallpox had been practically banished from Lexington and that of the 86 patients which the city had cared for not one had died. He reported that during February he vaccinated 4,036 persons and that private physicians vaccinated a still greater number. The cost to the city was $1,000.65.

The Hopkins County Medical Association at a recent meeting in Madisonville requested the Fiscal Court to build and maintain a tuberculosis sanitarium. They estimated that one out of every five deaths in the county was from tuberculosis.

At Henderson the Henderson County Board of Health was reorganized in January by the election of Dr. A. S. Denton as President and Dr. J. U. Ridley as County Health Officer. Dr. W. T. Travis and Dr Peyton Ligon, the previous incumbents, resigned

At Louisville Dr. J. W. Fowler, Superintendent of the new City Hospital, has added an eye clinic to the other departments. It is under the charge of Dr. J. M. Ray.

Dr. Emmett Proctor, of Stanford, died at the Norton Memorial Infirmy in Louisville from uraemia. He was 44 years old and leaves a widow and five children.

At Louisville the Eruptive Hospital, Dr. Harris Kelly, Superintendent, has been thoroughly inspected by the Health Officer, Dr. W. E. Grant, and rated at one hundred. Dr. Grant says the institution has no superior.

LOUISIANA.

At New Orleans Dr. Ralph Hopkins has tendered his report to the Board of Control of the Lepers' Home. There are 85 patients at the home and more cottages are needed. He reports that he is now using a vaccine from the bacteria of erysipelas in treating leprosy and finds it the most satisfactory treatment he has tried. He says that nine patients were discharged as cured some time ago and that others are improving.

At Monroe Dr. R. W. O'Donnell and Dr. C. P. Gray served as members of a lunacy commission

(Continued on page 22.)

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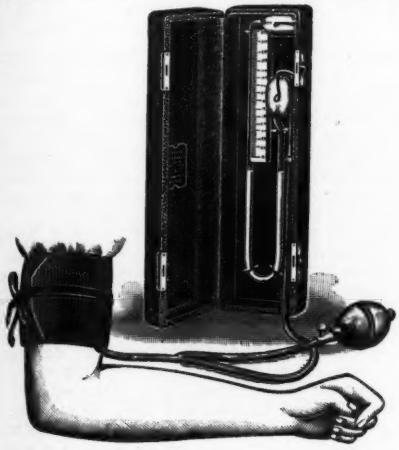

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MEDICAL NEWS

(Continued from page 20.)

in a case that took up a large portion of three days. Their bill was $75 each, which the jury refused to pay. Suit was brought and the doctors won their case.

At Jackson Dr. Kirk Odom, of Baton Rouge, committed suicide by hanging himself with a piece of sash rope. Failing health is supposed to be the cause.

Dean Isadore Dyer, of the Tulane Medical Department, was met by a large delegation of students and faculty in honor of his election to the presidency of the American Medical College Association at its recent meetng in Chicago.

On March 5 Dr. W. P. O'Reilly, of the City Board of Health, announced that during the past fifteen days not a single case of typhoid fever had appeared in New Orleans. He attributes this "to the screening of vaults, the making of sewer connections and the abolition of the old system."

The Louisiana State Medical Society meets in New Orleans April 21-23.

At Abbeville Dr. J. T. Abshire, of Leroy, has been elected by the police jury as a delegate to the meeting of the health authorities in New Orleans on Monday, April 20.

At Texarkana the citizens have united with the doctors to form a county health society for Bowie County, with Dr. T. H. Lanier as President.

At St. Gabriel Dr. O. G. Browne, 57 years of age, was found dead in the public road early one morning near the residence of Captain Murphy, of the Monticello penal farm. It is supposed that he was overcome by the cold and snowstorm. He left no immediate family.

Drs. C. C. Bass, C. W. Duval and A. L. Metz have received each a handsome medal from the National Institute of Social Sciences for notable achievements in the field of science.

MARYLAND.

Baltimore Items.

A druggist named Marion A. Potocki, 1636 Eastern Avenue, has had six charges preferred against him for illegally practicing medicine and conducting a pharmacy. He was released in bail of $100 on each charge to await the action of the grand jury.

In February Dr. Thaddeus W. Clark, 62 years old, and a veteran of the Spanish-American War, died at 58 West Biddle Street.

In March a Mr. Hugh O'Bracey sued Dr. George L. Wilkins, City Jail Physician, for $25,000 damages because of the death of his wife. He claims that the doctor failed to make proper examination and did not recognize her condition until she became fatally infected with uraemic poison.

On March 12 seven men and women were arrested on charges of practicing medicine without licenses from the State Board of Medical Examiners. One was a chiropodist, who did not limit her ministrations to the feet. A prescription signed by her was shown. It called for one bottle of a widely advertised brand of whisky and the directions were: "Take when necessary."

Miss Anna S. Baker, a well-to-do woman of 2052 East Hoffman Street, was arrested on the charge of prescribing and furnishing medicine without having passed the prescribed medical examination or registering as a practicing physician. The police show in evidence a bottle of her medicine and her cards, which advertised a cure for cancer by electrical massage.

At his home at Rose Hill, Hartford Road, Dr. Henry Tucker Harrison, aged 69 years, died of pneumonia March 4. He leaves a widow, four daughters and five sons.

MISSISSIPPI.

During the session of the Legislature at Jackson a member proposed a law making it unlawful for any person not a licensed physician to engage in the practice of obstetrics. The penalty was no less than a $1,000 fine. A similar fine was proposed on unlicensed pharmacists or physicians to sell drugs or give any medicines unless directed by a lawful doctor. Similar provisions applied to other breaches of the proposed law.

In March State Health Officer Dr. W. H. Rowan, accompanied by Dr. Chaplain, Health Officer of Providence, R. I., visited Natchez and other towns in the state in a study of general health and sanitary conditions. They were operating under the auspices of the American Medical Association.

It is charged that the county jail at Meridian is dangerous to prisoners, is a breeding place for tuberculosis, that several have died from the disease contracted therein and that others have become infected. The District and County Attorneys looked into the matter as soon as it was reported to them.

Dr. J. M. Matthews, of Louisville, Ky., ex-President of the American Medical Association, accompanied by Mrs. Matthews, have been visiting Biloxi.

It is claimed that a Gulfport physician was the first doctor in the United States to apply the famous nitrate of silver anti-cigarette cure to major league baseball players. In addition to the professionals twenty Gulfport youths were treated by him one Sunday night in a local drug store and the majority of them are reported cured. Several applications are required.

On March 15, at Oakvale, sixteen miles north of Columbia, the body of Miss Clara Polk, aged 19, with a bullet hole through her heart, and that of Dr. John J. Stringer, aged 42, were discovered near a mill where the father of the girl served as night watchman.

Dr. M. J. Alexander, President of the Mississippi State Board of Health, resigned his position because of its interference with his private practice.

Surgeon R. H. Creel, of the United States Public Health Service, after thorough investigation, declares that all of the waters of the Mississippi Sound tributary to Biloxi and Gulfport are badly polluted, and the oysters taken therefrom are unfit for use. Ten cases of typhoid fever were traced to the infected oysters.

At Carriere, Hancock County, on March 5, Dr. Wellington Locke died suddenly from a stroke of paralysis. His age was 41.

At Jackson early in March scarlet fever prevailed to such an extent that very rigid quarantine measures had to be enforced. No person was al-

(Continued on page 24.)

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Branches and Agencies in 103 Principal Cities. Dealers Everywhere
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MEDICAL NEWS

(Continued from page 22.)

lowed to enter or leave an infected house without the permission of the proper health authority.

Dr. J. J. Stringer was found dead near his home in Oakvale, March 21st, with gunshot wound in his head. For more than fourteen years he had been a successful practitioner of Lawrence county.

Dr. J. E. Banks died at his home in Prentiss, Miss., January 28th, of chronic nephritis, age 52. He was a graduate of Tulane, 1886, ex-presidnet Lawrence-Jefferson Counties Medical Association, and formerly health officer of Jefferson Davis County.

At the recent meeting of the State Medical Association at Columbus the following officers were elected for the coming year: Dr. J. S. Ullman, Natchez, President; Dr. J. W. Lipscomb, Columbus; Dr. Thomas Seay, Laurel; Dr. J. H. Portwoods, Kosciusko, vice-presidents. Dr. E. F. Howard, Vicksburg, secretary and Dr. J. M. Buchanan, Meridian, treasurer, were continued as officers of the association, having been elected for five years. Dr. T. M. Dye, Clarksdale, was re-elected as a member of the council, and Dr. J. C. Culley, Oxford, was made a new member of that body.

NORTH CAROLINA.

The North Carolina State Board of Health has issued a bulletin in the guise of an almanac, with proper health notes for each month. Considerable space is devoted to the sanatorium for the treatment of tuberculosis at Montrose. It is finely illustrated.

Dr. J. R. Gordon is assisting the Department of Vital Statistics of the State Board of Health in securing the registration of every birth and death in the state.

At Winston-Salem the managers of the Hookworm Commission examined about 77 per cent of the children of one school, of whom 20 per cent proved to be infected.

On March 15, at Charlotte, the health authorities reported that in the entire city there remained only 33 cases of smallpox, most of whom were in the district north of Tenth Street. It is not thought there will be any further spread.

The Seventh District Medical Society, embracing nine counties in the state, and holding two meetings annually, held its second annual clinical conference about the middle of March at Charlotte. In all twenty-seven operations were performed in one day. Some 30 visiting physicians were present.

During the latter part of March Wake County had five free dispensaries for the treatment of hookworm. An examination held in May showed that over half the children were infected, and for this reason the County Commisisoners joined with the state in suppressing it.

SOUTH CAROLINA.

In the police court at Greenville a colored prisoner was found to be well broken out with smallpox. Policemen, reporters and serving men, together with the unvaccinated generally, at once sought the protection of vaccination.

At Columbia, February 25, the House of Representatives passed the bill for state-wide medical inspection of school children. Concerning this bill Governor Blease declared: "Before I would sign such a bill I would resign and go off forever into eternal oblivion."

At the State Hospital for the Insane, Dr. James W. Babcock and Dr. Elenora B. Saunders, two physicians above criticism or reproach and whose zeal and ability are widely recognized, have resigned their positions because in their opinion conditions made the retention thereof impossible. Other employes in sympathy with them wished to leave the asylum also, but they were persuaded not to for the present.

A widespread epidemic of measles is shown by the morbidity report of the state for the month of February. There were 1,404 cases. Pneumonia was also widespread, and there were 210 cases of mumps.

TENNESSEE.

On March 15 Dr. Thomas A. Allen, 89 years old, one of the oldest residents of Hendersonville, N. C., died while on a visit to his daughter in Nashville. He leaves three daughters, two of whom are married, and a son, Dr. Thomas A. Allen, of Columbia, Tenn.

At Russellville in March the County Board of Health ordered that all churches, schools and places of public gathering be closed owing to the epidemic of smallpox then prevailing. A large number of people were exposed to the contagion because the diagnosis of smallpox was denied.

At Memphis about the middle of March a party of school children attended a social gathering at a house where there was a case of scarlet fever. Thirteen new cases resulted. A house-to-house inspection was effected before the health officials would allow the schools to be reopened.

At Milan Dr. S. E. Caldwell, while crossing the I. C. Railroad near the stock yards, had his buggy struck by a freight train. He was badly cut about the face and head and his carriage was demolished before the horses could be stopped.

At Chattanooga Dr. W. F. McManus was elected County Physician to succeed Dr. H. O. Null.

The first formal meeting of the Memphis Clinical Society was held on the night of March 12. Membership is limited to forty. Dr. Marcus Haase is President and Dr. Richmond McKinney is Secretary.

Dr. L. P. Brown, State Food and Drug Inspector, during his visit to Memphis, caused the grand jury to return seven indictments of physicians and druggists for violations of the regulations of the dispensing of narcotics.

At the recent annual meeting of the Tennessee State Medical Association the following officers were elected for the coming year: Dr. S. M. Miller, Knoxville, president; Dr. Hilliard Wood, Nashville, vice-president for Middle Tennessee; Dr. J. M. Clack, Rockwood, vice-president for East Tennessee; Dr. L. F. Parker, Lexington, vice-president for West Tennessee; Dr. Olin West, Nashville, secretary; Dr. C. N. Cowden, Nashville, treasurer.

(Continued on page 26.)

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MEDICAL NEWS

(Continued from page 24.)

TEXAS.

At Amarilla on the 17th of March the home and garage of Dr. J. J. Crume, at 2106 S. Polk street, were entirely destroyed by fire. Origin unknown.

Dr. Ralph Steiner, State Health Officer, has issued a warning to the people of the State to guard against smallpox immediately. He says: "It has assumed its old malignant and fatal type. In one locality there were ten deaths among fifty patients; in another, thirteen among fifty-eight."

The department of health of the city of Galveston issued its second milk bulletin March 17. Forty-one samples of milk examined; three had been partially skimmed and one was watered. Three samples revealed dirt in visible quantities.

Early in March eight cases of smallpox of a mild character were discovered in Quanah.

Dr. R. B. Grammer, aged 53, died on March 1.

At Dallas the county court commissioners voted to pay $50 a month toward maintaining a resident physician at the Woodlawn Tubercular Hospital. It is maintained by the "United Charities." The city pays the other half of the salary. There were reported twenty-seven cases of typhoid fever in the city during February.

At Seguin in March several cases of smallpox were discovered among the Mexicans. The cases were promptly quarantined.

At a meeting of the Bexar County Medical Society a resolution was unanimously adopted proposing a joint hospital to be maintained jointly by the county and city, San Antonio. Judge W. F. Ezell, of the Seventy-third District Court, has ruled that the board of health had the right to make the rule requiring children to be vaccinated or be excluded from the public schools. This settles a question that has been an annoying one for some time. Dr. A. R. Hayes, city physician, has filed complaint in police court against five physicians who failed to report cases of typhoid fever.

At Dallas, Dr. J. A. Ewing, for forty years a resident of that city, died in February.

At Dallas, Emmit B. Summers, Secretary of the City Board of Health, reports that in February, the shortest month, there occurred the largest number of births registered in any month since the keeping of records started in the city. Two hundred and four were white and twenty-four were negroes.

Dr. W. R. P. Thompson, of Houston, has been appointed to the United States Public Health Service, and will be stationed at the Quarantine Station, Biloxi, Miss.

VIRGINIA.

Dr. J. Allison Hodges has been appointed by Gov. Stuart to represent Virginia at the Third Annual Meeting of Alienists and Neurologists of the United States, to be held under the auspices of the Chicago Medical Society in Chicago, July 14 to 18, 1914.

State Bacteriologist Ferguson, in affording arguments in support of the State Board of Health bill for the "regulation and restraint of dogs," reports that during the last three years 315 persons have been treated by him at the Pasteur Institute while during the same time 250 Virginians received treatment in Washington. In addition thirty-five were treated at a private institute in Richmond. There were four deaths from hydrophobia last year, none of them patients of the State Board.

The City Council of Petersburg has appropriated $999 for the purchase of vaccine virus and the employment of physicians to make house to house visits and do vaccination.

Governor Stuart has appointed Dr. T. Edwin Baird, of Norfolk, quarantine officer for the district of Elizabeth river, succeeding Dr. Frank H. Hancock. His duties embrace the entire harbor of Norfolk, including Hampton Roads.

In Northhampton county, Dr. W. A. Brumfield, an inspector of the State Board of Health, working with the Rockefeller Sanitary Committee, made an inspection of the school children of the county for hookworm. Of 1,682 children examined only thirty-six were found infected, being a trifle over two per cent.

At Lynchburg all the children of the public schools, white and colored, are being vaccinated as a prerequisite to attendance.

The Legislature has abrogated the requirement that graduates in dentistry shall also be full graduates in medicine.

At Richmond in March four physicians were arrested and bound over to the courts for failing to keep proper records of their prescriptions for narcotics.

At Lynchburg, March 13, Dr. James A. Anderson, a retired physician, died suddenly in a Main street drug store.

Dr. Thomas Edward Converse, forty-five years of age, formerly a physician of Louisville, Ky., died in January at his farm in Hanover county. He was a brother of Harry P. Converse, managing editor of the Christian Observer.

WEST VIRGINIA.

At Parkersburg, Miss Ruth Caldwell has resigned the position of district nurse for the local Anti-Tuberculosis Society, and Miss Jennie Jones, of Jackson, Ohio., was appointed to fill the vacancy.

At Huntington the nurses and patients at the C. & A. hospital are held in quarantine because of the development of a case of smallpox in that institution. All employes on that division were ordered vaccinated.

At Wheeling, February 26, Dr. William J. Bates, aged 67, died from cardiac paralysis.

The public and high schools of Shinnston were closed about the middle of March by order of Health Officer Dr. D. L. Coffindaffer on account of scarlet fever among the school children.

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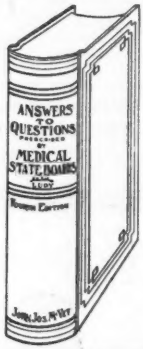

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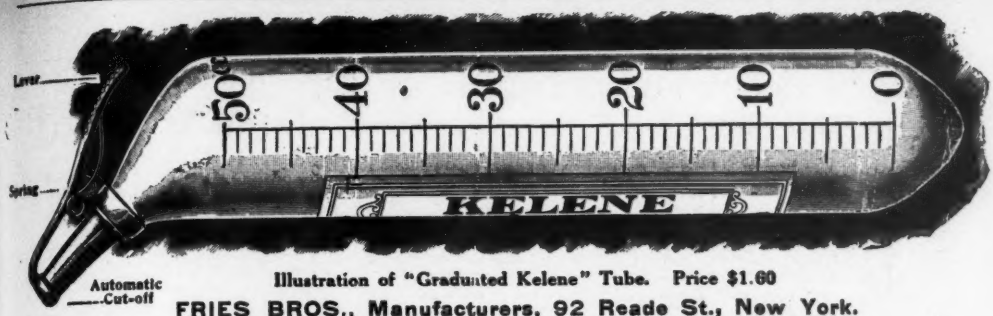

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